
ALSNews Vol. 168 January 17, 2001

Contents of This Issue:

1. VIBRONIC FEATURES IN POLYMER NEXAFS

by Annette Greiner
(Contact: stephen.urquhart@usask.ca)

Researchers conducting polymer analyses with the Scanning Transmission X-Ray Microscope (STXM) on Beamline 7.0.1 have observed a phenomenon not previously considered relevant to the spectra of polymers. Their work has shown that vibronic effects--the combination of electronic and vibrational changes--have a significant effect on the near-edge x-ray absorption fine structure (NEXAFS) spectra of polystyrene. The observation of vibronic features in this polymer suggests that the phenomenon affects spectra of other large, complex molecules. This information will be crucial in interpreting future spectra as finer resolutions make smaller spectral features observable.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/polystyrene.html.

Publication about this research: S.G. Urquhart, H. Ade, M. Rafailovich, J.S. Sokolov, and Y. Zhang, "Chemical and vibronic effects in the high-resolution near-edge x-ray absorption fine structure spectra of polystyrene isotopomers," Chem. Phys. Lett. 322, 412 (2000).

2. FIRST COMMERCIAL LIGA BEAMLINE IN U.S. UNDER CONSTRUCTION

(Contact: dboehme@axsun.com)

The first beamline for commercial LIGA (deep-etch x-ray lithography) in the country has been approved by the ALS Scientific Advisory Committee and is expected to begin commissioning in February. Funding for Beamline 3.3.1 comes from AXSUN Technologies, a Massachusetts-based company that provides miniaturized opto-electronic modules for fiber-optic telecommunications networks. These modules are essentially optical benches the size of computer chips, containing complex assemblies of high-precision optical, mechanical, and electrical subassemblies that align and focus incoming photon signals, convert them into electrical signals, and route them through switches into the appropriate paths. AXSUN will use LIGA techniques at the new beamline for the microfabrication of key alignment structures (patent pending) measuring roughly 2 millimeters wide by 500 micrometers thick. The process involves an eight- to ten-hour x-ray exposure using a high-contrast PMMA resist to etch molds

of the required shape. The ALS was selected for its appropriate wavelength range and its proximity to Livermore, California, site of a new AXSUN expansion facility dedicated to LIGA manufacturing. The new ALS beamline will have a footprint very similar to that of Beamline 3.3.2, the existing LIGA research and development facility in Sector 3.

3. REMINDER: COMPENDIUM ABSTRACTS DUE NEXT MONDAY
(Contact: LSTamura@lbl.gov)

By now, all ALS users from last year (including ALS staff members) should have received a packet in the mail calling for abstracts describing the work they have done, in whole or in part, at the ALS during the year 2000. The deadline for submitting abstracts is Monday, January 22, 2001. If you have not yet received an instruction packet, or have questions about the submission process, please contact Lori Tamura by email (LSTamura@lbl.gov) or phone (510-486-6172). The information in the packets (including author guidelines, file specifications, and a submission form) can also be found on the Web at http://alspubs.lbl.gov/Compendium_old.

The abstracts received will be published on a CD that will be included in the 2000 ALS Activity Report. The abstracts will also be added to the searchable database of abstracts available on our Web site at http://alspubs.lbl.gov/compendium. Like last year, we will again accept electronic files in a number of formats, preferably PDF; hardcopy submissions are no longer necessary. The ALS thanks you for your cooperation in this effort to demonstrate the breadth, depth, and importance of the ALS scientific program.

4. MICROSCOPES, JOBS INFO ADDED TO ALS WEB

Two new features have been added to the ALS Web site. First, a Microscopes page can be found at http://www-als.lbl.gov/als/microscopes. The page collects in one place performance specs, publications, and the like for all ALS beamlines with high spatial resolution. There is also a link to a PDF version of the May 1997 brochure "Soft X-ray Microscopy: Materials Characterization on a Microscale." Second, an ALS Employment Opportunities page can be found at http://www-als.lbl.gov/als/quickguide/employment.html. It gives instructions on how to find ALS-related jobs in the Berkeley Lab Current Job Opportunities pages. Both the Microscopes and Employment Opportunities pages can be reached via links on the main ALS Web site (http://www-als.lbl.gov).

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
T.J. Wilkinson and Dale Perry (Berkeley Lab)
Ted Raab (Univ. of Colorado at Boulder)
Hoi-Ying Holman (Berkeley Lab)
Karl Nieman and Ron Sims (Utah State Univ.)
Wendy Panero and Raymond Jeanloz (Univ. of California, Berkeley)

Beamline 5.3.1
Ali Belkacem, Ernie Glover, and Marcus Hertlein (Berkeley Lab)

Beamline 7.3.1.1

Boris Sinkovic (Univ. of Connecticut)
Harald Ade (North Carolina State Univ.)

Beamline 7.3.1.2
Bob Opila (Lucent Technologies)

Beamline 7.3.3
Alain Manceau (Univ. Joseph Fourier, France)

Beamline 8.0.1
Kevin Wilson (Univ. of California, Berkeley)
Christoph Bostedt (Lawrence Livermore National Laboratory)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of December 13 - 18, December 19 - 21, January 5 - 8, and January 9 - 14, the beam availability was 98%. Of the scheduled beam, 91% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

http://www-library.lbl.gov/teid/tmRco/howto/RcoBerkeleyLabDisclaimer.htm
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ALSNews Vol. 169 January 31, 2001

Contents of This Issue:

1. PFI-PEPICO DATA SUGGEST RECALIBRATION OF PROTON AFFINITIES

by Lori Tamura
(Contact: baer@unc.edu)

The transfer of a proton from one molecule to another is a basic chemical reaction and an important step in many biological processes. Thus, knowledge of a molecule's proton affinity--its tendency to grab hold of a proton--is highly useful in modeling or analyzing such reactions. Over 500 molecules have proton affinities whose values are known relative to each other. However, only a few key molecules lend themselves to measurements that can establish absolute proton affinity values. Such measurements have been made with unprecedented accuracy by chemical dynamics researchers using a combination of pulsed-field ionization (PFI) and photoelectron-photoion coincidence (PEPICO) techniques at Beamline 9.0.2 of the ALS. The results indicate that the current proton affinity scale should be shifted down by about 8 kJ/mol.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/proton_affinity.html.

Publications about this research: T. Baer, Y. Song, C.Y. Ng, J. Liu, W. Chen, "The Heat of Formation of 2-C3H7+ and Proton Affinity of C3H6 Determined by Pulsed Field Ionization-Photoelectron Photoion Coincidence Spectroscopy," J. Phys. Chem. A 104(9), 1959 (2000). T. Baer, Y. Song, J. Liu, W. Chen, C.Y. Ng, "Pulsed field ionization-photoelectron photoion coincidence spectroscopy with synchrotron radiation: The heat of formation of the C2H5+ ion," Faraday Discuss. 115, 137 (2000).

2. BEAMLINES BRIGHT DESPITE ROLLING BLACKOUTS

While nearby offices may have been voluntarily darkened to conserve energy this month, beamlines at the ALS continued to deliver photons of their usual brightness. The ALS is not subject to the rolling blackouts that occurred in California earlier this month because Berkeley Lab's power is supplied through a long-term contract with the Western Area Power Administration, a DOE-run facility. Western has guaranteed that Berkeley Lab's power will not be curtailed when California's Independent System Operator (ISO), the manager of the state's electrical grid, requests that the electrical utilities initiate rolling blackouts. One reason Western

can make this guarantee is that it has a number of other "interruptible" customers that voluntarily curtail their power when requested.

For the past several weeks, the state has been under daily Stage 3 alerts, meaning that power reserves are below 1.5% of available capacity. Rolling blackouts, the sequential power outages that affect whole sections of the electrical grid at a time, were ordered statewide for the first time on January 17, as demand exceeded supply. Western Area Power has requested that, during Stage 3 alerts, all of its electrical energy customers voluntarily reduce the use of nonessential electrical equipment. On-site users and staff are requested to help in this effort through the following actions:

1. Turn off lights when leaving a room for more than one minute.
2. Use task lights; turn off general and overhead lights.
3. Turn off all decorative lighting.
4. Turn off computer monitors when idle.
5. Activate and use energy-saving features on office equipment.
6. Shut off coffee pots, radios, fans, space heaters, and other nonessential appliances.

3. DEADLINE FOR COMPENDIUM ABSTRACTS EXTENDED

(Contact: LSTamura@lbl.gov)

In response to requests for extra time and to ensure that as many users as possible are represented in our annual compendium of research, we have extended the deadline for abstract submission to February 5, 2001. So far, the ALS has received about 140 abstracts for work done in the year 2000. We are currently in the process of indexing the abstracts and sending out acknowledgments; we ask for your patience as we work through the backlog of files that were received by the deadline last week. Many thanks to all those who submitted their work in a timely manner.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(harald_ade@ncsu.edu)

Dear ALS Users,

I would like to update you for the first time in my new role as chair of the ALS Users' Executive Committee. My tenure promises to include both exciting as well as challenging times. On the one hand, the ALS is more productive than ever, and funding for special initiatives at DOE such as the nanotechnology initiative has increased substantially. The ALS community is in great spirits and is "chugging" away, and new office and laboratory space on the ALS mezzanine is becoming available. On the other hand, core science funding at DOE has not seen any increases, and funding for the next-generation projects that will keep the ALS in an international leadership position is difficult to obtain. This is raising important issues, and unless new resources become available, a delicate balance between funding for ongoing research and investments into new projects might be required. This being the case, it is obvious that we can not rest on the "good feelings" generated by the general increase in science funding last year. We have to keep up the

pressure on all fronts. I am looking forward to a productive joint effort between all users, the UEC members, the ALS, and DOE management in this regard. My perspective for the year is thus primarily outward looking, towards more cooperation with other facilities and more activism on national funding issues. At the same time, we will not neglect to provide input into important internal ALS decisions.

The new UEC members will be announced shortly. Any issues that you feel should be addressed can be brought to the attention of the UEC through any of the UEC members.

Lastly, I would like to point out that one of the first business items of the UEC this year will be a review of the ALS user policies and the UEC charter. Several changes are planned, such as providing review criteria for independent investigators and formalizing a conflict resolution process.

Best regards,
Harald Ade

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Karl Nieman and Ron Sims (Utah State Univ.)
Felicia Betancourt and Bob Glaeser (Berkeley Lab and Univ. of California, Berkeley)
James Chesko (Chiron Corp.)
Said Talbi (Univ. of California, Berkeley)
Tom Breunig (Univ. of California, San Francisco)
Jessica Preciado, Ralph Greif, and Boris Rubinsky (Univ. of California, Berkeley)

Beamline 7.3.1.1
Kannan Krishnan (Berkeley Lab)
Simone Anders (IBM Almaden Research Center)
Boris Sinkovic (Univ. of Connecticut)

Beamline 8.0.1
Tom Callcott (Univ. of Tennessee)
Dave Ederer (Tulane Univ.)
Alex Moewes (Univ. of Saskatchewan, Canada)
Ernst Kurmaev (Russian Academy of Sciences)
Clemens Heske and Eberhard Umbach (Univ. of Wuerzburg, Germany)

Beamline 10.0.1
Francois Wuilleumier, Denis Cubaynes, Jean-Marc Bizau, Jean-Phillipe Champeaux (Univ. Paris-Sud), and Segolene Diehl (Univ. Pierre et Marie Curie, France)
Jonathan Denlinger (Berkeley Lab)

Atsushi Fujimori (Univ. of Tokyo)
Z.X. Shen, Xingjiang Zhou, Pavel Bogdanov (Stanford Univ.), and Alessandra Lanzara (Univ. of Rome)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of January 18 - 22 (1.5 GeV) and 23 - 28 (1.9 GeV), the beam availability was 97%. Of the scheduled beam, 87% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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ALSNews Vol. 170 February 14, 2001

Contents of This Issue:

1. MORE TROUBLE FOR THE DIPOLE APPROXIMATION

by Art Robinson
(Contact: lindle@nevada.edu)

A multi-institutional collaboration comprising both theorists and experimentalists working at the ALS has made the first measurements of second-order nondipole effects in the angular dependence of the cross section for neon valence photoemission. The finding potentially applies to a wide variety of x-ray photoemission studies, including gas-phase, surface-science, and materials-science work, where researchers may now need to account for the influence of higher-order nondipole terms beyond the standard dipole approximation conventionally applied to the interaction of x rays with matter.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/dipole_approx.html.

Publication about this research: A. Derevianko, O. Hemmers, S. Oblad, P. Glans, H. Wang, S.B.Whitfield, R. Wehlitz, I.A. Sellin, W.R. Johnson, D.W. Lindle, "Electric-Octupole and Pure-Electric-Quadrupole Effects in Soft-X-Ray Photoemission," Phys. Rev. Lett. 84, 2116 (2000).

2. ALS/SSRL MEETINGS FOSTER CLOSER TIES

(Contact: ZHussain@lbl.gov)

Representatives of the ALS and Stanford Synchrotron Radiation Laboratory (SSRL) management teams are scheduled to meet today at SSRL to discuss coordination and cooperation between the two light sources. Efforts will be made to coordinate scheduled installation shutdowns of the two facilities in an attempt to ensure the uninterrupted availability of x rays to researchers on the West Coast. Common areas of interest--such as detector development, highly correlated materials, and x-ray crystallography--will be identified, and possible areas for consolidation of efforts will be discussed. This meeting will be the second of many anticipated between the two management teams in an attempt to foster closer ties between the two facilities.

3. BEAMLINE 12.0.1 TO RECEIVE NEW SPECTROSCOPY ENDSTATION

(Contacts: dessau@colorado.edu, ZHussain@lbl.gov)

A new angle-resolved photoemission spectroscopy experimental endstation is being installed on Beamline 12.0.1, replacing MAXIMUM, which will be retired after many years of service. MAXIMUM, one of the first photoelectron microscopes, was initially installed on the Aladdin storage ring in Wisconsin before being moved to the ALS soon after the ALS became operational. The new photoemission experimental endstation will utilize a Scienta SES-100 analyzer. A new 1200-lines/mm variable-line-spacing grating monochromator will allow the beamline to operate with a resolving power of over 10,000. Also, new refocusing optics will be installed in the beamline to provide suitable focusing for the experiments. Alexei Federov, a postdoc with Dan Dessau (Univ. of Colorado at Boulder), is leading the effort to assemble the experimental apparatus. This endstation will expand the ability of the ALS to serve the large community of x-ray photoemission users on Beamlines 7.0.1, 8.0.1, and 10.0.1, as well as further increase the utilization of Beamline 12.0.1.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(harald_ade@ncsu.edu)

The UEC election results have been certified and I am pleased to announce the winners: Jennifer A. Doudna (Howard Hughes Medical Institute and Department of Molecular Biophysics and Biochemistry, Yale University), Dennis W. Lindle (Department of Chemistry, University of Nevada, Las Vegas), Gerry McDermott (Physical Biosciences Division, Berkeley Lab), and student/postdoc member Aaron M. Covington (Department of Physics, University of Nevada, Reno).

These four new members will serve on the UEC for three years, rotating off in 2003. They will join continuing UEC members Rupert Perera (Berkeley Lab), Roger Falcone (Univ. of California, Berkeley), Lewis Johnson (Florida A&M Univ. and Berkeley Lab), Carolyn Larabell (Univ. of California, San Francisco, and Berkeley Lab), Cheuk-Yiu Ng (Iowa State Univ. and Ames Laboratory), past chair Nora Berrah (Western Michigan Univ.), and chair Harald Ade (North Carolina State Univ.). Many thanks to retiring members Stephen Kevan (Univ. of Oregon), Charles Fadley (Univ. of California, Davis), James Underwood (Berkeley Lab), and former student member David Hansen (Univ. of Nevada, Las Vegas). Congratulations to the election winners, and welcome to the UEC!

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

The ALS will be operating in two-bunch mode February 14-26. Following are some of the experimenters who will be collecting data during this time.

Beamline 4.0.1-2
Reinhard Doerner and colleagues (Univ. of Frankfurt, Germany)
Allen Landers (Western Michigan Univ.)
Timur Osipov (Kansas State Univ.)
Michael Prior (Berkeley Lab)

Beamline 5.3.1
Phil Heimann (Berkeley Lab)

Beamline 6.3.2
Eberhard Spiller (Univ. of Maryland, National Institute of Standards and Technology, Lawrence Livermore National Laboratory)

Beamlines 6.3.1, 8.0.1, and 9.3.1
Dennis Lindle (Univ. of Nevada, Las Vegas) and colleagues

Beamline 10.0.1
Nora Berrah and colleagues (Western Michigan Univ.)
Emma Sokell (Univ. College Dublin)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of January 30 - February 5 and February 6 - 11, the beam availability was 98%. Of the scheduled beam, 83% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

ALSNews Vol. 171 February 28, 2001

Contents of This Issue:

1. UPDATE ON SUPERBEND AND CONSTRUCTION PROJECTS

(Contact: JTKrupnick@lbl.gov)

Fabrication of the cryogenic subsystems for the superconducting bend magnets (superbends) and overall assembly was started some months ago and is entering a critical period. Most of the parts for the superbend magnets, including the cores, poles, and superconducting coils, have been fabricated. The task now is to assemble everything into four superbend systems that meet the demanding specifications required of these magnets before they can be installed in the ALS storage ring. The first system was dismantled in December in order to make modifications necessary to improve its cryogenic performance. It has been retested at the vendor's facility and, as of press time, is expected to be shipped to Berkeley Lab today for extensive magnetic measurements and further cryogenic tests. The remaining three superbend systems, each of which will incorporate the cryogenic improvements, are expected to arrive at Berkeley Lab by May 15, June 15, and June 30. The shutdown to install the three superbends into the storage ring (the fourth is a spare) is scheduled to begin on August 20.

There have been a series of delays in the first phase of the build-out of new offices and labs on the Building 6 mezzanine. This phase, which includes three labs, twelve offices, a small conference room/lounge, and a copy room, is now scheduled to be finished at the beginning of March. The second phase, which includes four additional labs, should be complete by July. Due to funding constraints, the last seven offices may not be completed until December 2001. In the very near future, the User Services Office will be moving down the hall into the new mezzanine area. The chemical dynamics group will leave its current space in the mezzanine and will also move into some of the new offices. Their old offices will be needed to accommodate the many new groups working on protein crystallography.

2. CRYSTALLOGRAPHY PROPOSAL PROCESS MAY BE EVOLVING

(Contact: GFKrebs@lbl.gov)

During its last meeting, the Proposal Study Panel for macromolecular crystallography discussed the possibility of allowing independent investigators "rapid access" to the crystallography beamlines. The access needs of crystallography experimenters are quite different from those in

the general sciences. Beamtime in the general sciences must be scheduled at least two months in advance, as some experimenters come from overseas and experimental setups can often take considerable time. Crystallography experimenters, on the other hand, often need very rapid access (i.e., on the order of a few days) to a preexisting facility, because the quality of protein crystals can degrade over time.

In this last proposal cycle, 39 new proposals and 42 rollover proposals were received. Although we expect to allocate only about 30% of the beamtime requested because of the high demand, we expect to increase this percentage when Beamlines 5.0.1 and 5.0.3 begin running for independent investigators in the near future. In addition, five other crystallography beamlines are funded, with construction on the Howard Hughes Medical Institute superbend beamlines at Sector 8 well under way.

3. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(harald_ade@ncsu.edu)

The UEC's first meeting of the year will be held on Friday, March 16, at the ALS. Some agenda items are as follows: selection of a vice chair, report from ALS management (funding, long-range planning, update on new building, possibility of eight-hour fills, etc.), planning for the next ALS User Meeting, review of the UEC election process, review of Proposal Study Panel operations, and review of suggested changes to the user policy document. If you have any issues that you would like the UEC to discuss, please voice them to me or any of the UEC members. Contact information can be found on the ALS Web site at http://www-als.lbl.gov/als/uec/UECcontacts.html.

4. RECENT PUBLICATIONS

Fu, D., A.M. Libson, L.J.W. Miercke, C. Weitzman, P.K. Nollert, J. Krucinski, and R.M. Stroud, "Structure of a glycerol-conducting channel and the basis for its selectivity," Science 290(5491), 481 (October 2000).

Han, B.-G., W. Nunomura, Y. Takakuwa, N. Mohandas, and B.K. Jap, "Protein 4.1R core domain structure and insights into regulation of cytoskeletal organization," Nat. Struct. Biol. 7(10), 871 (October 2000).

Hura, G., J.M. Sorenson, R.M. Glaeser, and T. Head-Gordon, "A high-quality x-ray scattering experiment on liquid water at ambient conditions," J. Chem. Phys. 113(20), 9140 (November 2000).

Muramatsu, Y., H. Takenaka, Y. Ueno, E.M. Gullikson, and R.C.C. Perera, "Chemical bonding state analysis of silicon carbide layers in Mo/SiC/Si multilayer mirrors by soft x-ray emission and absorption spectroscopy," Appl. Phys. Lett. 77(17), 2653 (October 2000).

Stichler, M., C. Keller, C. Heske, M. Staufer, U. Birkenheuer, N. Roesch, W. Wurth, and D. Menzel, "X-ray emission spectroscopy of NO adsorbates on Ru(001)," Surf. Sci. 448, 164 (December 2000).

Suto, R.K., M.J. Clarkson, D.J. Tremethick, and K. Luger, "Crystal structure of a nucleosome core particle containing the variant histone H2A.Z," Nat. Struct. Biol. 7(12), 1121 (December 2000).

Wilson, K.R., J.G. Tobin, A.L. Ankudinov, J.J. Rehr, and R.J. Saykally, "Extended x-ray absorption fine structure from hydrogen atoms in water," Phys. Rev. Lett. 85(20), 4289 (November 2000).

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
James Chesko (Chiron Corp.)
Alex Gavriliuk (Russian Academy of Sciences)
Raymond Jeanloz (Univ. of California, Berkeley)
Upal Ghosh (Stanford Univ.)
Hoi-Ying Holman (Berkeley Lab)
Tom Breunig and Dan Fried (Univ. of California, San Francisco)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)
Ted Raab (Univ. of Colorado at Boulder)

Beamline 5.3.1
Ernie Glover, Henry Chong, Bob Schoenlein (Berkeley Lab)

Beamline 7.3.1.1
Z. Q. Qiu (Univ. of California, Berkeley)
Andrew Smith (Daresbury Laboratory, UK)

Beamline 7.3.3
K.-N. Tu (Univ. of California, Los Angeles)
Alain Manceau (Univ. Joseph Fourier, France)

Beamline 8.0.1
Christoph Bostedt and Tony van Buuren (Lawrence Livermore National Laboratory)
Manfred Neumann and Bernd Schneider (Univ. of Osnabrueck, Germany)
Tom Callcott (Univ. of Tennessee)
Dave Ederer (Tulane Univ.)

Beamline 10.3.1
Dale Sayers (North Carolina State Univ.)
Claudine Chen (California Institute of Technology)

6. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of February 14-18 and 21-26 (two-bunch mode), the beam availability was 97%. Of the scheduled beam, 94% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 172 March 14, 2001

Contents of This Issue:

1. CROSSLINK DENSITY OF SUPERABSORBENT POLYMERS

by Art Robinson
(Contacts: gemitchell@dow.com, harald_ade@ncsu.edu)

Often viewed as primarily a tool for basic research, synchrotron radiation nonetheless has its share of industrial users looking for solutions to their problems. At the ALS, researchers from The Dow Chemical Company teamed with academic colleagues to conduct x-ray spectromicroscopy studies of superabsorbent polymers (SAPs), materials with a $2 billion annual market for a wide range of products including disposable baby diapers. The experiments were such a success that Dow has been able to use the results to help develop the process technology now being designed for a new SAP-manufacturing plant. Because of this and related work on x-ray spectromicroscopy of polymeric materials, Dow's Analytical Sciences division has conferred on two of the Dow researchers its highest internal award.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/superabsorb.html.

Publication about this research: G.E. Mitchell, L.R. Wilson, M.T. Dineen, S.G. Urquhart, F. Hayes, E.G. Rightor, A.P. Hitchcock, and H.W. Ade, "Quantitative Characterization of Microscopic Variations in the Crosslink Density of Gel" (submitted 2001).

2. BERKELEY-STANFORD SYNCHROTRON SUMMER SCHOOL ANNOUNCED

(Contacts: attwood@eecs.berkeley.edu, nilsson@ssrl.slac.stanford.edu)

The first Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications will be held at the Clark Kerr campus of the University of California, Berkeley, July 8-14, 2001. The program will include basic lectures on the synchrotron radiation process, requisite technologies, and a broad range of scientific applications. Visits to both the ALS in Berkeley and the Stanford Synchrotron Radiation Laboratory will be included, with opportunities to interact with professional staff and graduate students at both facilities. The summer school will be limited to approximately forty graduate students, with a preference for those pursuing doctoral research in the physical sciences in which synchrotron radiation is expected to play a significant role. Co-chairs for this first summer school are David Attwood (attwood@eecs.berkeley.edu) and Anders Nilsson (nilsson@ssrl.slac.stanford.edu).

Details about the summer school, planned lectures, housing, and costs will be posted soon at http://www.unex.berkeley.edu/eng/synchrotron. Cost of attendance will be $595 for the one-week course (Sunday afternoon through Saturday morning), including lectures, shared room, meals, and local transportation from the lecture site to the two synchrotron radiation facilities. Applications should include a brief academic record, a statement describing the intended research area and how a knowledge of synchrotron radiation would enhance those studies, a list of publications (if any), and information on how to reach the applicant by email and phone through the period extending to the time of the summer school. Applications can be sent electronically to Course6@unx.berkeley.edu or by mail to Jenny Black Deer/Joan Shao, Berkeley-Stanford Summer School, University of California Extension, 1995 University Avenue, MC 7010, Berkeley, CA 94720-7010.

3. JOB OPPORTUNITIES AT THE ALS

Listed below are a few ALS-related positions that are currently available. For more detailed information on a specific job, go to the Berkeley Lab Current Job Opportunities Web page (http://cjo.lbl.gov/) and perform a keyword search on the Job Requisition Number (shown below in parentheses). For a complete listing of ALS-related openings (including engineering, computing, and administrative), search on the keywords "Advanced Light Source."

X-Ray Optics Postdoc (011904). Work on the development of microfocus x-ray optics based on mirror systems and in their application to micro x-ray absorption spectroscopy and microdiffraction. One-year appointment with the possibility of renewal.

Synchrotron Infrared Postdoc (012765). Develop and enhance the far-infrared facilities at the ALS. One-year appointment with the possibility of renewal.

Solid State Physics Postdoc (013071). Perform research into charge and orbital ordering in strongly correlated materials. One-year appointment with the possibility of renewal.

Associate Beamline Scientist (012963). Assist scientists in a wide variety of experiments and coordinate the activities of engineering, facilities, and administrative staff to provide optimal beamline and experiment support.

Beamline Scientist (013122). Operate synchrotron-based instumentation, assist in developing an active community of scientists interested in carrying out forefront research through collaboration with ALS users and through your own research, and have primary responsibility for day-to-day beamline operation.

Biophysicist Scientist/Engineer (013011). Provide technical and scientific support for users at the Berkeley Center for Structural Biology at the Advanced Light Source. Develop methodology and instrumentation for collecting and analyzing crystallographic data using synchrotron radiation. Participate in projects involving the structure determination of biological molecules and biomolecular complexes.

4. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Jessica Preciado, Ralph Greif, Boris Rubinsky (Univ. of California, Berkeley)
Chad Leidy, John Crowe (Univ. of California, Davis)
T.J. Wilkinson, Dale Perry (Berkeley Lab)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)
Hoi-Ying Holman (Berkeley Lab)

Beamline 7.3.1.1
Boris Sinkovic (Univ. of Connecticut)
Kannan Krishnan (Berkeley Lab)
Harald Ade (North Carolina State Univ.)

Beamline 9.3.2
Allen Johnson (Univ. of Nevada, Las Vegas)

Beamline 8.0.1
Paul Alivisatos, Erik Scher (Univ. of California, Berkeley)
Christoph Bostedt, Tony Van Buuren (Lawrence Livermore National Laboratory)
Satish Myneni (Princeton Univ.)
Anders Nilsson (Stanford Univ.)

Beamline 10.3.1
Dale Perry (Berkeley Lab)

5. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of February 27 - March 4 and March 5 - 11, the beam availability was 98%. Of the scheduled beam, 87% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 173 March 28, 2001

Contents of This Issue:

1. POPULAR BERKELEY LAB X-RAY DATA BOOKLET REISSUED

(Contact: ACThompson@lbl.gov)

X-ray scientists and synchrotron radiation users who have been patiently waiting for an updated version of the popular X-Ray Data Booklet last published in 1986 by the Center for X-Ray Optics (CXRO) at Berkeley Lab can breathe a sigh of relief. The venerable "little orange book" has now been reissued under the auspices of CXRO and the ALS with an April printing of 10,000 paper copies and the posting of a Web edition at http://xdb.lbl.gov.

David Attwood (CXRO), Janos Kirz (SUNY, Stony Brook), and Doug Vaughan (Berkeley Lab), the original editors of the x-ray data booklet, modeled their product after the even more venerable Particle Data Booklet, published by Berkeley Lab's Particle Data Group. With a wealth of x-ray information packed into a pocket-sized format, the booklet was required reading at synchrotron beamlines around the world, where it was often seen labeled with the hopeful entreaty "Do not remove from beamline." Some scientists were alleged to have secret stashes from which they carefully distributed copies to favored friends and colleagues. But the booklet has long been out of print.

The editorial torch has now been passed to Al Thompson (ALS) and Doug Vaughan, who have overseen a major revamping of the entire booklet from beginning to end. The contents have been reorganized; tables and texts have been updated; and new chapters on emission energies, the history of synchrotron light sources, and useful x-ray formulae have been added. They have divided the data booklet into sections on the x-ray properties of the elements, synchrotron radiation, scattering processes, optics, and miscellaneous, with several chapters of text and tables in each section. All of this was accomplished without significantly changing the length, now at 166 pages.

Available free of charge, the x-ray data booklet can be ordered directly from the Web by clicking on the image of the cover and filling out the order form. In addition, scientists at ALS, APS, CHESS, NSLS, and SSRL can obtain a booklet at their respective user offices.

2. INDEPENDENT INVESTIGATOR PROPOSAL SCORES ON-LINE
(Contact: GFKrebs@lbl.gov)

The Proposal Study Panel (PSP) for the general sciences beamlines met a few weeks ago and assigned scores to independent investigator proposals for beamtime from May to November 2001. As a whole, approximately 60% of the requested beamtime was allocated. However, the percentage of proposals receiving at least some beamtime was about 80%. The distribution of scores for these beamlines can be viewed on the Web at http://www-als.lbl.gov/als/quickguide/pspscores.html. The distribution of scores for the heavily oversubscribed Beamlines 7.0.1, 8.0.1, and 10.0.1 can be viewed separately via links from the page referenced above.

The protein crystallography PSP also met recently and reviewed about 60 proposals for beamtime on Beamline 5.0.2 from April to December 2001. Due to heavy use of this facility, only about 50% of the proposals received some beamtime. The score distribution and cutoff score for this beamline are also shown on the Web at http://www-als.lbl.gov/als/quickguide/pspscores_mcf.html.

3. ALS TO POLL USERS ON STORAGE RING REFILL PREFERENCES
(Contact: GFKrebs@lbl.gov)

Now that improvements to the storage ring's high-power RF system are complete, the ALS has been able to increase the beam lifetime for 1.9 GeV operation. To better understand user needs regarding storage ring refills, the ALS will be emailing to all users a brief questionnaire asking for their preferences for refill frequency (eight vs. six hours) and scheduling (fixed vs. variable times). If you are an ALS user and have not received a questionnaire by March 30, 2001, contact the ALS User Services Office at alsuser@lbl.gov. The deadline for responding to the poll is April 4, 2001.

4. ICESS8 PROCEEDINGS NOW AVAILABLE
(Contacts: csfadley@lbl.gov, terminello1@llnl.gov)

The proceedings of the Eighth International Conference on Electronic Spectroscopy and Structure (ICESS8), held in Berkeley last August, have now been published in the Journal of Electron Spectroscopy and Related Phenomena, Volumes 114-116, Issues 1-3, March 2001. The proceedings can also be viewed electronically as PDF files at http://www.elsevier.nl/gej-ng/29/30/33/show/Products/SID/frame.htt.

Conference co-chairs Chuck Fadley (Univ. of California, Davis, and Berkeley Lab) and Lou Terminello (Lawrence Livermore National Laboratory) congratulate editors Adam Hitchcock (McMaster Univ., Canada) and Tong Leung (Univ. of Waterloo, Canada), as well as the rest of the editorial staff at Elsevier, on a superb job of producing these proceedings in what may be record time.

5. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

The UEC met on March 16 at the ALS and had a productive meeting with ALS management. Roger Falcone (Univ. of California, Berkeley) was elected vice chair. Gerry McDermott (Physical Biosciences Division, Berkeley Lab) will be the UEC representative at the weekly ALS senior management meetings. Rupert Perera (Center for X-Ray Optics, Berkeley Lab) will head a small committee that will organize the Users' Meeting, which will be held October 15-16, 2001.

Unfortunately, after a healthy funding increase in fiscal year 2001, the funding outlook for 2002 is not very good. To some extent, the community still seems to be "shell shocked." The ALS UEC is coordinating, with the UECs of other facilities, a campaign to promote funding for science. We will be focusing, in particular, on legislative support for the Department of Energy's Office of Science. All ALS users will be asked explicitly in the near future to help with this campaign. The window of opportunity for influence will be very small, and collective action will be required.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Upal Ghosh (Stanford Univ.)
Hoi-Ying Holman and Kathy Bjornstad (Berkeley Lab)
Jessica Preciado, Ralph Greif, Boris Rubinsky (Univ. of California, Berkeley)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)
Ted Raab (Univ. of Colorado at Boulder)

Beamline 7.3.1.1
Shirley Chiang (Univ. of California, Davis)

Beamline 8.0.1
Fred Schlachter and Wayne Stolte (Berkeley Lab)
Tom Callcott (Univ. of Tennessee)
Dave Ederer (Tulane Univ.)

Beamline 9.3.2
David Shuh, Dario Arena, Glenn Waychunas (Berkeley Lab)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of March 14-19 and 20-25, the beam availability was 96%. Of the scheduled beam, 81% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 174 April 11, 2001

Contents of This Issue:

1. FIRST CALL: GENERAL SCIENCES PROPOSALS DUE JUNE 1

(Contact: alsproposals@lbl.gov)

The User Services Office is now accepting proposals from scientists who wish to conduct research as independent investigators in the general sciences during the running period from December 2001 to May 2002. The deadline for submissions is June 1, 2001. (This information does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must fill in a one-page Experiment Report/Beamtime Request and submit it to the User Services Office by the June 1 deadline. The numeric rating for each proposal will be communicated to the investigator along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

Independent investigator process
http://www-als.lbl.gov/als/quickguide/independinvest.html

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

2. ALS TO OFFER DOCTORAL FELLOWSHIPS FOR 2001-2002

(Contact: kwsheets@lbl.gov)

The ALS is offering several doctoral fellowships in residence for the 2001-2002 academic year. Through these fellowships, qualified graduate students will gain hands-on experience using

synchrotron radiation by performing a major part of their thesis work at the ALS. Applicants must be full-time Ph.D. students pursuing synchrotron-radiation-based research in the physical or biological sciences and have passed all qualifying or comprehensive verbal and written examinations (generally third-year students). The deadline for applying is June 1, 2001.

The fellowships include a one-year appointment (with the possibility of renewal) and a $15,000 annual stipend. Fellows will be matched with an on-site mentor (generally a beamline scientist) and have access to ALS resources, including beamtime. Fellows are expected to present their results at a meeting or as a seminar at the end of the fellowship year. More detailed information, along with links to frequently asked questions and the application form, can be found at http://www-als.lbl.gov/als/fellowships/index.html.

3. ALS ATTRACTS INTEREST FROM STUDENTS, TEACHERS, AND MEDIA

(Contact: ejmoxon@lbl.gov)

The ALS commitment to scientific and educational outreach continues to attract visitors of all ages and interests. Recent visitors have included the following:

- Ten girls from the Techbridge Science Club of Montera Middle School in Oakland, California, were given a tour inside the ALS accelerator by Division Deputy Director for Operations Ben Feinberg. The group then visited Deborah Yager (Life Sciences Division, Berkeley Lab) at Beamline 6.1.2 to get the inside story of the x-ray microscope and Gretchen Giedt (Physical Biosciences Division, Berkeley Lab) at Beamline 5.0.2 for an introduction to protein crystallography. The science club is cosponsored by the Chabot Space and Science Center in Oakland.
- Thirty-five engineering and physics students from the Ecole Polytechnique de Tunisie were greeted by ALS Director Daniel Chemla, who is originally from Tunisia himself, as they toured the ALS as part of their trip to high-tech facilities around California.
- Thirty high school physics teachers from Northern California who were attending the American Association of Physics Teachers conference held at Berkeley Lab came to the ALS to see some of the science they teach come to life.
- Students from the Society of Physics Students, holding a statewide meeting at the Lab, toured the ALS as part of their program.

Also interested in the ALS are both local and international media. Wiktor Niedzicki of Telewizja Polska (Polish TV) stopped by the ALS to film documentary segments for a science education program in Poland, and a local adventure program, "Bay Area Backroads," came to the ALS and Berkeley Lab to film a show introducing the Lab, its scientists, and their research to the local community. The episode is scheduled to air in the Bay Area on KRON-TV, Sunday, April 29, at 6 p.m. and midnight.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

Workshops have become an important and integral part of the ALS Users' Meeting. They are a great way of creating and discussing new ideas, formulating scientific cases for new projects, or pondering intriguing details of a particular field. They also provide a mechanism for gathering input from nonsynchrotron experts and encouraging foreign participation. The UEC strives to organize the highest-quality workshops possible in conjunction with this year's Users' Meeting, to be held Oct. 15-16, 2001.

It is not too early to plan, and the UEC is asking for input in order to achieve this goal. Please make suggestions about topics that could lead to successful and productive workshops and transmit these to Rupert Perera (RCPerera@lbl.gov), Dennis Lindle (lindle@nevada.edu), and/or Harald Ade (harald_ade@ncsu.edu) as soon as possible. An indication of the size of the field and/or potential participation would also be appreciated.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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Tom Breunig and Dan Fried (Univ. of California, San Francisco)
Robin Beneditte and Raymond Jeanloz (Univ. of California, Berkeley)
Hoi-Ying Holman and Kathy Bjornstad (Berkeley Lab)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)

Beamline 5.3.1
Phil Heimann (Berkeley Lab)

Beamline 7.3.1.1
Rainer Fink (Univ. of Wuerzburg, Germany)
Gary Mitchell (The Dow Chemical Company)
Adam Hitchcock (McMaster Univ., Canada)

Beamline 10.3.1
Dale Perry (Berkeley Lab)
Eleanor Blakely (Berkeley Lab)
Eicke Weber (Univ. of California, Berkeley)

6. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user run of March 27 - April 2, the beam reliability (time delivered/time scheduled) was 96%. Of the scheduled beam, 79% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

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ALSNews Vol. 175 April 25, 2001

Contents of This Issue:

1. ATOMIC HOLOGRAMS SUCCESSFULLY OBTAINED

(Contacts: smarchesini@lbl.gov, fadley@photon.lbl.gov)

At Beamline 9.3.1, a group led by Stefano Marchesini (Materials Sciences Division, Berkeley Lab) has demonstrated the feasibility of performing x-ray fluorescence holography (XFH) experiments at the ALS. XFH is a newly developed, element-specific probe of atomic structure that overcomes the so-called "phase problem" of conventional x-ray diffraction by extracting information on the phase as well as the amplitude of the diffracted field. Such experiments can be carried out in two modes: one in which the modulation of an outgoing fluorescence signal is measured as a function of direction (often termed simply XFH), and one in which the modulation of the ingoing beam is measured as a function of direction and perhaps also energy (often termed multi-energy x-ray holography, or MEXH). Both types of experiments are challenging in that they require the accurate measurement of modulations that are on the order of a few tenths of a percent, and so far only about five groups worldwide are doing such studies. An April 2001 article in Physics Today (Vol. 54, No. 4) discusses these and other types of atomic holography.

The system constructed at Beamline 9.3.1 has been designed to carry out MEXH experiments, which are inherently faster, more accurate, and more versatile. The apparatus makes use of a special rapid rotation of the specimen to more efficiently average over various sources of noise, and it has been possible in a first set of demonstration experiments to accurately image the positions of the Mn atoms in a MnO single crystal. Holograms and holographic images, including a movie of the rotating Mn atom structure, can be seen at http://electron.lbl.gov/marchesini/als/indexnew.html. Future applications of this new facility will include studies of strongly correlated materials, magnetic materials, quasicrystals, and model compounds of biological interest. Collaborating on this work were S. Marchesini, L. Zhao, N. Mannella, M.W. West, M.J. Press, L. Fabris, J. Bucher, D.K. Shuh, W.C. Stolte, A.S. Schlachter, Z. Hussain, and C.S. Fadley.

2. CRYSTALLOGRAPHY ROBOT DEBUTS IN SCIENCE MAGAZINE

(Contact:TNEarnest@lbl.gov)

"Crystals in, structures out." This vision of a fully automated process for solving protein structures is now one step closer to reality with the first trial runs of a robotic crystal-mounting and alignment system on Beamline 5.0.3. These groundbreaking initial tests were reported in the News section of the April 13, 2001, issue of Science (Vol. 292, No. 5515). The system is being developed as a collaboration between the Berkeley Center for Structural Biology, Berkeley Lab's Bioinstrumention Group, the biotech company Syrrx, and the private research institute GNF (Genomics Institute of the Novartis Research Foundation). Funding for the project comes from the National Institute of General Medical Sciences (one of the National Institutes of Health), including a recent award to continue development of the "robohutch," and from Syrrx though the operational support of Beamline 5.0.3. Funding for the construction and operation of Beamline 5.0.3 comes from GNF and Syrrx, both of La Jolla, California.

Robotic crystallization of proteins has been pioneered at Berkeley Lab over the past four years. The crystallography robot is designed so that it can be programmed to select from up to 64 protein crystals and then mount, align, test, and collect data from each. Cryofrozen crystals can be sent to the facility for automated data collection. It is estimated that, by automating these and other related functions, researchers would be able to solve protein structures up to 10 times faster than the current rate. Such an acceleration will be necessary for the success of research programs that aim to elucidate the structure and function of tens of thousands of proteins over the next five to ten years. In addition to the robot, the automation system will eventually include analysis software to process the huge amounts of data collected. The projected completion date for the full system is 2003.

3. EUV PARTNERS ANNOUNCE CHIP-MAKING PROTOTYPE

(Contact: DTAttwood@lbl.gov)

A group of computer industry leaders in cooperation with government laboratories recently announced the completion of the first full-scale prototype machine that uses extreme ultraviolet (EUV) lithography to print integrated circuit patterns onto computer chips. EUV Limited Liability Company (EUV LLC) members Intel, Motorola, Advanced Micro Devices, Micron, Infineon, and IBM partnered with Lawrence Livermore, Lawrence Berkeley, and Sandia National Laboratories to develop the technology required to continue the current pace of microchip improvement through the next decade. Computer processors produced with EUV technology are expected to be tens of times faster than today's most powerful chips, with similar increases in the storage capacity of memory chips. The prototype chip maker demonstrates all the critical capabilities required for making the next generation of computer chips with EUV light. It will be used during the next year to refine the technology and develop prototype commercial machines that meet industry requirements for high-volume chip production.

Contributing to the success of this important milestone were teams working at three beamlines at the ALS, under the auspices of Berkeley Lab's Center for X-Ray Optics. At Beamline 6.3.2, work focused on measuring the reflectivity and uniformity of multilayered molybdenum-silicon coatings, which are central to the EUV lithography process. Beamline 11.3.2 was dedicated to finding tiny defects in lithography masks, a task equivalent to searching for a golf ball in an area the size of Rhode Island. Finally, because EUV lithography places extremely high demands on the fabrication of EUV mirror substrates and multilayer coatings, the interferometer at Beamline 12.0.1, touted as the most accurate wavefront-measuring device in the world, was indispensable

for characterizing and predicting the performance of the precision optics critical to EUV lithography.

4. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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Chris Weber and Joe Orenstein (Univ. of California, Berkeley, and Berkeley Lab)

Beamline 1.4.3
Jani Ingram (Idaho National Engineering and Environmental Laboratory)
Hoi-Ying Holman (Berkeley Lab)
Ted Raab (Univ. of Colorado at Boulder)
Ronald Brudler (The Scripps Research Institute)

Beamline 5.3.1
Marcus Hertlein, Ali Belkacem, Ernie Glover, Mike Prior, Glenn Ackerman, and Juergen Roesch (Berkeley Lab)

Beamline 7.3.1.1
Simone Anders (IBM Almaden Research Center)
Kai Starke (Freie Univ. Berlin)
Denis Usov (Institute of Polymer Research, Dresden, Germany)

Beamline 7.3.3
Greg Hura (Berkeley Lab)

Beamline 8.0.1
Satish Myneni (Princeton Univ.)
Anders Nilsson (Stanford Univ. and Uppsala Univ., Sweden)
Christoph Bostedt (Lawrence Livermore National Laboratory)

Beamline 10.0.1
R. Phaneuf and colleagues (Univ. Nevada, Reno)
Z.X. Shen, X. Zhou, and colleagues (Stanford Univ.)
N. Berrah (Western Michigan Univ.)

Beamline 10.3.1
Claudine Chen (California Institute of Technology)

5. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of April 3-8 (1.5 GeV), 11-15 (1.9 GeV), and 16-22 (1.9 GeV), the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 89% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 176 May 9, 2001

Contents of This Issue:

1. HOW CARBON MONOXIDE ADSORBS AT DIFFERENT SITES

by Lori Tamura
(Contact: nilsson@slac.stanford.edu)

Deep within an ideal crystalline solid, every atom has a full complement of neighboring atoms, held in place by chemical bonds in all three dimensions. In contrast, atoms on the two-dimensional surface remain partially unattached, leaving "unsaturated" bonds that are available for chemical reactions with external substances. An understanding of how simple molecules bond to such surfaces is important for many different fields of science, including heterogenous catalysis, electrochemistry, biomaterials, and molecular environmental science. A basic question is why molecules preferentially bond to sites with a particular geometry. At Beamline 8.0.1 of the ALS, a research group from Sweden has employed x-ray emission spectroscopy experiments on carbon monoxide and performed ab initio electron density calculations to explore the subtle interplay between the electronic and geometric structure of adsorbates.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/carbon_monoxide.html.

Publication about this research: A. Foehlisch, M. Nyberg, J. Hasselstrom, O. Karis, L.G.M. Pettersson, A. Nilsson, "How Carbon Monoxide Adsorbs in Different Sites," Phys. Rev. Lett. 85(15), 3309 (2000).

2. UPDATE ON CALIFORNIA'S ELECTRICAL POWER CRISIS

(Contact: B_Feinberg@lbl.gov)

Until now the California power crisis has had little effect on Berkeley Lab beyond prompting energy conservation measures. On April 3, however, the California Public Utilities Commission ruled that customers receiving transmission-level voltage are no longer necessarily exempt from rotating outages. Pacific Gas and Electric (PG&E), the Bay Area utility company, has interpreted this ruling as including Berkeley Lab.

If Berkeley Lab were subject to rotating outages, it would be extremely harmful to the research program at the ALS and at other Berkeley Lab facilities. Negotiations are continuing between the U.S. Department of Energy (DOE), the three California national laboratories, and PG&E. At present, Berkeley Lab is planning to participate in a program whereby the Lab would be exempt from outages in exchange for reducing power consumption whenever any of the rotating outage blocks are affected. The Lab plans to lease sufficient generator capability to reduce the load on PG&E during each of these outages, thus avoiding the necessity of shutting down the Lab. Stay tuned for further updates.

3. RESULTS OF POLL ON REFILL TIMES

(Contact: B_Feinberg@lbl.gov)

The results of the recent user poll on storage-ring refill times are in and have been carefully analyzed. The poll showed no significant preferences for any one of the four options: six hours between fills, eight hours between fills, fixed refill times, or variable refill times (the latter would apply when an unscheduled interruption causes the schedule to be reset). However, when correlations in the responses were analyzed, there was a significant preference for two combinations of the four options: six hours between fills with variable refill times, and eight hours between fills with fixed refill times.

To serve both of these communities, at the suggestion of Users' Executive Committee (UEC) Chair Harald Ade, we will run for a few months with each set of conditions. We are currently running with six hours between fills and variable refill times. In the next several months, after working out the details, we will try eight hours between fills and fixed refill times. Of course, before making the switch we will provide ample notice in ALSNews.

4. REMINDER: PHYSICAL SCIENCES PROPOSALS DUE JUNE 1

(Contact: alsproposals@lbl.gov)

The User Services Office is still accepting proposals from scientists who wish to conduct research as independent investigators in the physical sciences during the running period from December 2001 to May 2002. The deadline for submissions is June 1, 2001. (This information does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must fill in a one-page ALS Experiment Report and Request for Beamtime form and submit it to the User Services Office by the June 1 deadline. The numeric rating for each proposal will be communicated to the investigator along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

Independent investigator process
http://www-als.lbl.gov/als/quickguide/independinvest.html

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

5. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

On May 7th, representatives from the user groups of the four U.S. DOE synchrotron facilities met with staffers for members of the Senate Energy and Water Appropriations Committee, the House Science Committee, and the House Energy and Water Appropriations Committee. These staffers were briefed on the significant scientific, technological, educational, and, in the end, economic contributions these facilities make and how important it is to adequately support them. In a broader context, support was requested from the above committees for doubling the research budget of the physical sciences (through agencies such as the National Science Foundation and the DOE Office of Science) over five years. Additional meetings were held on May 8th with staffers from the Office of Science and Technology Policy and the Office of Management and Budget to have a positive impact on the budget for FY 2003. Another series of visits to individual senators and congressmen of user states or districts is planned for late May or early June. Later during the summer, there will be a direct call from the ALS UEC for a more targeted letter-writing compaign.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.2
Chris Weber and Joe Orenstein (Univ. of California, Berkeley, and Berkeley Lab)

Beamline 1.4.3
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)
T.J. Wilkinson and Dale Perry (Berkeley Lab)
Tom Breunig and Dan Fried (Univ. of California, San Francisco)
Shyamsunder Erramilli (Boston Univ.)
Hoi-Ying Holman and Kathy Bjornstad (Berkeley Lab)

Beamline 7.3.1.1
Christian Stamm and Joachim Stohr (Stanford Synchrotron Radiation Laboratory)

Beamline 7.3.3
K.-N. Tu (Univ. of California, Los Angeles)

Beamline 8.0.1
Alex Moewes (Univ. of Saskatchewan)
Tom Callcott (Univ. of Tennessee, Knoxville)
Dave Ederer (Tulane Univ.)
Eric Fullerton (IBM Almaden Research Center)
Jeff Kortright (Berkeley Lab)

Beamline 10.0.1
Z.X. Shen and coworkers (Stanford Univ.)
N. Berrah and coworkers (Western Michigan Univ.)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of April 24-30 and May 1-6, the beam reliability (time delivered/time scheduled) was 95%. Of the scheduled beam, 82% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
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ALSNews Vol. 177 May 23, 2001

Contents of This Issue:

1. FIRST HIGH-RESOLUTION STRUCTURE FOR AN AQUAPORIN

by Annette Greiner
(Contact: stroud@msg.ucsf.edu)

How can a modest molecule be a great bouncer? Like a heavy at an exclusive night club, an aquaporin can see to it that only the desired molecules enter a cell, stiffly excluding all others. Yet, despite their finickiness, these proteins allow rapid influx of molecules of the right class. Aquaporins are a large family of proteins that selectively yet efficiently transport water or glycerol molecules--but no ions--across membranes in plants, animals, bacteria, and even yeast. Ten of these occur in humans, and more than 150 have been sequenced. But until now, scientists have not had a clear enough view of their structure to understand just how they enforce their exclusivity.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/ glycerol.html.

Publication about this research: D. Fu, A. Libson, L.J.W. Miercke, C. Weitzman, P. Nollert, J. Krucinski, and R.M. Stroud, "Structure of a glycerol-conducting channel and the basis for its selectivity," Science 290, 481-486 (2000).

2. LAST CALL: PHYSICAL SCIENCES PROPOSALS DUE JUNE 1

(Contact: alsproposals@lbl.gov)

Friday, June 1, 2001, is the deadline for independent investigator proposals in the physical sciences for the running period from December 2001 to May 2002. (This information does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must fill in a one-page ALS Experiment Report and Request for Beamtime form and submit it to the User Services Office by the June 1 deadline. The User Services Office has sent email confirmations for all proposals received so far. If you submitted a proposal but have not received confirmation, please contact Bernie Dixon at alsproposals@lbl.gov. The numeric rating for each proposal will be communicated to the investigator along with comments from the Proposal Study Panel, where appropriate. The cutoff

rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

Independent investigator process
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http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

3. EIGHT-HOUR, FIXED-TIME TRIAL PERIOD SET

(Contact: B_Feinberg@lbl.gov)

As described in the last issue of ALSNews, we are planning to run for a few months with eight hours between fills and fixed refill times. The first trial of this schedule will commence on June 12 and run through August 20 (with the exception of the July 3-15 two-bunch period, which has its own refill schedule).

During the trial, the storage ring will be refilled at 7:00 a.m., 3:00 p.m., and 11:00 p.m. These times were chosen to avoid both shift changes and the early morning hours. To help remain on schedule, requests for delays of the refill time will be limited to 15 minutes.

In case of beam loss, the storage ring will be immediately refilled, regardless of the time. If it is less than two hours before a scheduled refill, however, that refill will be skipped and the schedule will resume at the next refill hour. Otherwise, the storage ring will be refilled as scheduled. For example, if the beam is lost at 12 noon, the storage ring will be refilled immediately and filled again at 3:00 p.m. However, if the beam is lost between 1:00 p.m. and 3:00 p.m., the storage ring will be refilled immediately and next filled at 11:00 p.m.

Please contact Ben Feinberg (B_Feinberg@lbl.gov, 510-486-7725) if you believe this trial will cause you problems.

4. BERKELEY LAB TO PARTICIPATE IN ENERGY REDUCTION TEST

The State of California will conduct a one-day energy emergency exercise tomorrow, May 24. Local, state, and federal government facilities are being asked to maximize their energy conservation measures during specific time blocks during the day in order to measure the effectiveness of the emergency energy response program. Berkeley Lab and other federal locations will receive a mock Stage 3 Emergency Load Reduction Test notice requesting

implementation of short-term conservation measures. The announcement will be issued at around 11 a.m. via email and public address systems. The exercise will conclude at 12:30 p.m.

Measures that employees and on-site users can take include reducing nonessential lighting, turning off computers and printers that are not in use, turning off heating and cooling appliances, unplugging unnecessary personal appliances, and suspending use of copiers and other heavy-use equipment during the test. California's Independent System Operator will monitor the load reduction impact and assess how effective public sector employees can be at saving electricity during peak business hours.

5. USERS' MEETING IN OCTOBER; WORKSHOP DEADLINE JUNE 1

(Contacts: RCPerera@lbl.gov, lindle@nevada.edu)

It's not too early to mark your calendar for this year's ALS Users' Meeting, to be held at Berkeley Lab Monday, October 15, through Wednesday, October 17. The program will again feature oral presentations of ALS science highlights from the past year, as well as reports on recent work from young researchers, a poster session, vendor exhibits, and a keynote speaker. This year, two full days (Tuesday and Wednesday) will be devoted to specialized workshops covering a variety of topics including environmental science, highly correlated electron systems, coherent infrared developments, the synchrotron radiation research theory network (SRRTNet), and x-ray crystallography. Anyone wishing to organize additional workshops should contact Rupert Perera (RCPerera@lbl.gov) or Dennis Lindle (lindle@nevada.edu) by Friday, June 1, 2001.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Dennis Deen and Miranda Harmon-Smith (Univ. of California, San Francisco)
Hoi-Ying Holman (Berkeley Lab)
T.J. Wilkinson and Dale Perry (Berkeley Lab)
Robin Benedetti and Raymond Jeanloz (Univ. of California, Berkeley)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)

Beamline 8.0.1
Eric Fullerton (IBM Almaden Research Center)
Jeff Kortright (Berkeley Lab)
Jonathan Denlinger (Berkeley Lab)
David Shuh (Berkeley Lab)

Beamline 10.0.1
Nora Berrah (Western Michigan Univ.)
John Farley (Univ. of Nevada, Las Vegas)

Beamline 12.0.1

Mike Malinowski (Sandia National Laboratory)
Ken Goldberg and Patrick Naulleau (Berkeley Lab)

7. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of May 8-13 and May 16-21, the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 91% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

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ALSNews Vol. 178 June 6, 2001

Contents of This Issue:

1. ANTIFERROMAGNETIC SPIN REORIENTATION

by Art Robinson
(Contact: HOhldag@lbl.gov)

One of the vexing mysteries facing researchers in magnetic materials is the origin of the exchange-bias effect in which an antiferromagnetic layer pins the magnetization of an adjacent ferromagnetic layer so that it doesn't reverse in an external magnetic field. Building on earlier work with the photoemission electron microscope (PEEM) on Beamline 7.3.1.1 at the Advanced Light Source, a German-American collaboration has taken an important step toward unveiling the secret of exchange bias by observing that spins near a nickel oxide antiferromagnet's surface reorient after deposition of a cobalt ferromagnetic layer. This discovery rules out models of exchange bias based on the common assumption that the spin configuration at the surface of the antiferromagnet is the same as that in its interior (bulk).

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/peem_spin.html.

Publication about this research: H. Ohldag, A. Scholl, F. Nolting, S. Anders, F.U. Hillebrecht, and J. Stohr, "Spin reorientation at the antiferromagnetic NiO(001) surface in response to an adjacent ferromagnet," Phys. Rev. Lett. 86, 2878 (2001).

2. LOCAL SEMINAR SCHEDULE NOW AVAILABLE ONLINE

(Contact: AMGreiner@lbl.gov)

Curious about quantum-dot lattices or the nuclear lighthouse effect? Wondering about the latest developments in femtosecond-pulse research or the latest hardware developments at ELETTRA? A wide variety of seminars and meetings occur in and around the ALS every week that are of potential interest to many people beyond those working on site day in and day out. Now, everyone, including nonlocal users who will be in town for an experiment run and "semilocal" ones who reside in the Bay Area, can learn in advance about ALS-related seminars and meetings by checking the Web at http://www-als.lbl.gov/als/workshops/recurring.html (the page can also be reached via the "Recurring local seminars" link on the Meetings and Workshops page). The online schedule includes speakers, topics, times, and locations for upcoming seminars and meetings and is updated as needed--so bookmark the page and check back often!

3. JOB OPPORTUNITIES AT THE ALS

Listed below are a few ALS-related positions that are currently available. For more detailed information on a specific job, go to the Berkeley Lab Current Job Opportunities Web page (http://cjo.lbl.gov/), type the Job Requisition Number (shown below in parentheses) into the keyword search box, and click on the "GO" button (do not use the "return" key). For a complete listing of ALS-related openings, search on the keywords "Advanced Light Source."

Computer Scientist (012553). Develop computational methodology and instrumentation for collecting and analyzing crystallographic data using synchrotron radiation. Participate in projects involving the structure determination of biological molecules and biomolecular complexes.

Scientific Engineering Associate (012711). Play a lead role in the development of soft x-ray synchrotron radiation facilities in advanced microscopy and spectroscopy techniques specific to molecular environmental science (MES). Two-year appointment with the possibility of renewal.

Physicist Scientist/Engineer (013302). As an accelerator physicist, advise ALS management on activities aimed at detailed understanding of the ALS accelerators; collaborate with physicists, engineers, and technical support staff to perform planned experiments; publish results in peer-reviewed journals and present the results at conferences. Two-year appointment with the possibility of renewal.

Computer Systems Engineer I (Intern) (013487). Develop and support software that controls accelerator and beamline systems and collects, manages, and processes scientific data. One-year appointment with the possibility of renewal and/or conversion to career.

Executive Assistant (013580). Assigned to the ALS/Materials Sciences Division Director, provides executive-level assistance by representing the Director to various internal and external stakeholders, screening incoming communication, managing the Director's calendar, preparing correspondence and management presentations, and organizing meetings, conferences, and annual reviews.

Student Assistant (013359). As a summer student, assist with programmatic activities, such as taking data, working on accelerator hardware, and using the computer for simulations and calculations; assist in the design and fabrication of technical components; and provide logistical support. There is more than one opening for this position.

4. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Tom Breunig and Dan Fried (Univ. of California, San Francisco)
Ted Raab (Carnegie Institution of Washington)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)

Kelly Knutsen and Rich Saykally (Univ. of California, Berkeley)

Beamline 5.3.1
Christian Bressler (Univ. of Lausanne, Switzerland)
Melanie Saes (Univ. of Lausanne, Switzerland)
Raphael Abela (Paul Scherrer Institut, Switzerland)

Beamline 7.3.1.1
Adam Hitchcock (McMaster Univ., Canada)
Simone Anders (IBM Almaden Research Center)

Beamline 7.3.3
Bryan Valek (Stanford Univ.)
Ralph Spolenak (Lehigh Univ.)

Beamline 8.0.1
Fred Schlachter (Berkeley Lab)
Wayne Stolte (Berkeley Lab
Dave Ederer (Tulane Univ.)
Tom Callcott (Univ. of Tennessee, Knoxville)
Alex Moewes (Univ. of Saskatchewan, Canada)

Beamline 9.0.2
Andy Kung (Academia Sinica, Taiwan)
Matthias Kling (Univ. of Gottingen, Germany)

Beamline 9.3.2
Sefik Suzer (Brookhaven National Laboratory and Bilkent Univ., Turkey)
Pasl A. Jalil (King Fahd Univ. of Petroleum and Minerals, Saudi Arabia)
M. Faiz (King Fahd Univ. of Petroleum and Minerals, Saudi Arabia)

5. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of May 22 - 27 and May 31 - June 3, the beam reliability (time delivered/time scheduled) was 97%. Of the scheduled beam, 89% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 179 June 20, 2001

Contents of This Issue:

1. ELI ROTENBERG WINS PETER MARK AWARD

Eli Rotenberg of the ALS Scientific Support Group will receive the American Vacuum Society's 2001 Peter Mark Award for "furthering our knowledge of nanophase and reduced dimensionality systems by creative use of angle-resolved photoemission." This national award was established in 1979 by the American Vacuum Society (AVS) to recognize outstanding theoretical or experimental work by a young scientist or engineer (35 years of age or younger). A memorial to Dr. Peter Mark, who served as editor of the Journal of Vacuum Science and Technology from 1975 to 1979, the award includes a cash prize and will be presented at the 48th International AVS Symposium this fall in San Francisco, where Eli will give the Peter Mark Award Honorary Lecture.

Eli received his Ph.D. in physics from the University of California, Berkeley, in 1993 and has been a staff scientist at the ALS since 1996. As a member of the Scientific Support Group, he is responsible for the operation and scientific program of Beamline 7.0.1. The citation for the Peter Mark Award recognizes Eli's many outstanding contributions, examples of which include his work on quasicrystals, magnetic nanostructures, and electron-phonon coupling at surfaces, all of which have resulted in ALS research highlights (see Web pages listed below). Previous winners of this award who may be familiar to the ALS community are Dick Brundle (1980), Franz Himpsel (1985), and Marjorie Olmstead (1994).

Quasicrystals
http://www-als.lbl.gov/als/science/sci_archive/quasicrystals.html

Magnetic Nanostructures
http://www-als.lbl.gov/als/science/sci_archive/copperqws.html
http://www-als.lbl.gov/als/science/sci_archive/QWS.html

Electron-Phonon Coupling
http://www-als.lbl.gov/als/science/sci_archive/phonons2.html

2. ALS ENTERING DYNAMIC STEADY-STATE PHASE, SAYS DIRECTOR

ALS Director Daniel Chemla addressed ALS staff yesterday, providing an update on the status of the ALS. Daniel reported that, in the year since his last update, the number of ALS users increased from about 800 to 1200 and is projected to reach 1500 by 2002. Also, 20 new beamline projects are currently either operational (7), being commissioned (4), under construction (7), or being designed (2). In contrast to these indicators of rapid growth, the ALS faces either flat or slightly increasing funding. Daniel cautioned that this requires a realistic approach to strategic planning that balances user support vs. operation, focuses on quality rather than quantity, and maintains the ALS in a dynamic but steady state.

On the superbend project, Daniel reported that three of four superbend magnets have been received and are undergoing various stages of testing, with the fourth expected to be under test by the end of the week. Although the second unit's cryosystem performance does not meet specification, it is expected that the other three will be checked out and ready for installation by the beginning of the six-week shutdown starting in mid August, with beam to users scheduled to resume in October. In the interim, superbend number two would be brought up to specification and readied for use as a spare by the end of August. Another major initiative developing over the past year is what Daniel calls the Molecular Foundry: a state-of-the-art facility for the synthesis, processing, fabrication, and characterization of novel molecules and nanoscale materials. According to Daniel, proposals for a U.S. Department of Energy (DOE) national center for nanoscience were requested from 5 of 12 DOE laboratories. Of the three that were selected, Berkeley Lab's proposal finished first, and it is believed that funding is very likely forthcoming for a facility conceptual design in 2002 and for construction in 2003.

Daniel also reported on the status of three proposals from last year: Molecular Environmental Science (low-energy phase about 16 months from completion), PEEM3 (excellent reviews, partially funded by DOE, additional funding from other agencies), and femtosecond x rays (proposal submitted, workshop planned). In addition, he described three new proposals that are currently in the pipeline (coherent x rays, high pressure, and ultrahigh resolution spectroscopy for complex correlated phenomena in nanostructures). Also touched upon during the update were ALS meetings and workshops in the past year, research highlights, possible future projects (e.g. superconducting undulators, recirculating linac), and safety and diversity issues. At the end of the talk, former ALS project manager Ron Yourd was presented with the J.M. Nitschke Technical Excellence Award for his success in the enormous job of managing the ALS construction project through to completion, on budget and on schedule. The award was presented by Berkeley Lab nuclear chemist Albert Ghiorso and ALS Mechanical Engineering Group Leader Alan Paterson.

3. ONLINE HOUSING FORM SIMPLIFIES RESERVATIONS

(Contact: BEPhillips@lbl.gov)

Visiting researchers at the ALS and Berkeley Lab can now request reservations for the ALS Apartments by filling out a short form online. The apartments, located in downtown Berkeley, are conveniently located near the Berkeley Lab shuttle stop and minutes from restaurants, shopping, and a Bay Area Rapid Transit (BART) station. Visit the Housing Web page at

http://www-als.lbl.gov/als/quickguide/housing.html for additional information about the ALS apartments and to make reservations.

4. THE T-SHIRT CONTEST IS BACK!

(Contact: EJMoxon@lbl.gov)

The 2001 ALS Users' Meeting Program Committee is delighted to announce the return of the famed Users' Meeting T-Shirt Contest. Pencils are being sharpened and paintbrushes are being cleaned (and Photoshop is being opened!) around the world as frustrated artists everywhere prepare for the thrilling challenge of decorating the official meeting T-shirt. The contest is open to anyone with an imagination, and there is no limit to the number of entries one can submit. T-shirt designs should be no larger than 8.5 by 11 inches (22 cm by 28 cm) and the words "Advanced Light Source" or "ALS" must appear somewhere in the design. Rough drawings or concepts, as well as more polished artwork, are all acceptable. Enter now and enter often.

Send your designs by August 1 to

Elizabeth Moxon
Advanced Light Source
Berkeley Lab, MS 4-230
Berkeley, CA 94720
Fax: (510) 495-2111

5. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

Much of the UEC's attention is focused right now on planning for the ALS Users' Meeting and associated workshops to be held October 15-17 and on issues related to funding for the DOE's Office of Science in FY 2002 and beyond. Both efforts require input from many users, which is greatly appreciated by the UEC. The next meeting of the ALS UEC with ALS management is on July 11. If you have any issues that should be addressed by the UEC, please let any member know before then. Contact information can be found at http://www-als.lbl.gov/als/uec/UECcontacts.html.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.2
Chris Weber and Joe Orenstein (Berkeley Lab)

Beamline 1.4.3
Ronald Brudler (The Scripps Research Institute)

T.J. Wilkinson and Dale Perry (Berkeley Lab)
Hoi-Ying Holman (Berkeley Lab)
Vallejo High School Teachers (Integrated Science Partnership Project)

Beamline 4.0.1-2
Boris Bleijlevens (Univ. of Amsterdam, Netherlands)

Beamline 7.3.1.1
Shirley Chiang (Univ. of California, Davis)

Beamline 8.0.1
Yasuji Muramatsu (Japan Atomic Energy Research Institute)
Dave Sherman (Univ. of Bristol, UK)
Christoph Bostedt and Tony van Buuren (Lawrence Livermore National Laboratory)

Beamline 9.0.2
Andy Kung (Academia Sinica, Taiwan)
Matthias Kling (Univ. of Gottingen, Germany)

Beamline 10.0.1
Duane Jaecks (Univ. of Nebraska-Lincoln)
Z.X. Shen (Stanford Univ.)

Beamline 12.0.1
Chang Chang (Berkeley Lab)
Michael Shumway (Univ. of California, Berkeley)

7. HAVE A HAPPY FOURTH; BACK IN FOUR

Observing that the Fourth of July holiday falls fortuitously on an "ALSNews Wednesday" this year, the editorial staff has determined that it would be a good time to celebrate our independence from routine by taking a short summer break. Therefore, the next issue of ALSNews will be published on July 18--in four weeks, rather than the customary two. Have a happy Independence Day and we'll be back next month!

8. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of June 5-11 and 12-18, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 86% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The

Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 180 July 18, 2001

Contents of This Issue:

1. ELECTRONIC STRUCTURE OF CMR OXIDES

by Art Robinson
(Contact: dessau@spot.colorado.edu)

Complex (or correlated-electron) materials are on the frontier of materials physics because conventional solid-state theory is often unable to explain their frequently novel behavior, high-temperature superconductivity being a prime example. Among these materials are the manganese oxide compounds that exhibit the colossal magnetoresistance (CMR) effect. An American-Japanese collaboration working at the Advanced Light Source has now shown that the quasiparticle concept, a pillar of current solid-state theory, does retain its validity in CMR oxides, but the peculiarities of the electronic structure result in rapid fluctuations at the nanometer length scale of separate conducting and insulating phases, fluctuations that appear to underlie the CMR effect.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/cmr_oxides.html.

Publication about this research: Y.-D. Chuang, A.D. Gromko, D.S. Dessau, T. Kimura, and Y. Tokura, "Fermi Surface Nesting and Nanoscale Fluctuating Charge/Orbital Ordering in Colossal Magnetoresistive Oxides," Science 292, 1509 (2001).

2. CALL FOR ABSTRACTS: 2001 ALS USERS' MEETING

(Contact: alsabstract@lbl.gov)

The ALS Users' Meeting Program Committee invites ALS users, including students and postdocs, to submit abstracts for oral or poster presentations to be presented at the annual Users' Meeting, which will be held at Berkeley Lab on October 15-17, 2001. Abstracts can be submitted online at http://www-als.lbl.gov/als/usermtg/abstracts.html. Submission deadlines are as follows:

September 10, 2001
- to be considered for an oral presentation and/or the student poster competition

October 3, 2001

- to guarantee a space in the poster session and be included in the program booklet
October 10, 2001
- for space in the poster session on an "as available" basis

Oral presentations for the "junior researchers" and "science highlights" sessions will be selected by the committee from the abstracts received; other submissions will be presented as posters. The poster session (including the student poster competition) will be held in conjunction with a reception and buffet dinner on Tuesday, October 16. Information about the meeting program, speakers, registration, and accommodations will be posted at http://www-als.lbl.gov/als/usermtg/ as soon as it becomes available.

3. T-SHIRT CONTEST ENDS AUGUST 1

(Contact: EJMoxon@lbl.gov)

You tumble out of bed, tired and groggy from a long night spent at the beamline collecting data. You have a few hours yet to grab a bite to eat and then get back up the hill for more of the same. What a comfort it is to slip into that 2001 ALS Users' Meeting t-shirt with the eye-catching logo that looks and feels great no matter what condition the rest of you is in! The ALS Users' Meeting T-Shirt Contest is open to anyone with an imagination, and there is no limit to the number of entries one can submit. T-shirt designs should be no larger than 8.5 by 11 inches (22 cm by 28 cm) and the words "Advanced Light Source" or "ALS" must appear somewhere in the design. Rough drawings or concepts, as well as more polished artwork, are all acceptable.

Send your designs by August 1 to

Elizabeth Moxon
Advanced Light Source
Berkeley Lab, MS 4-230
Berkeley, CA 94720
Fax: (510) 495-2111

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

The ALS UEC met on July 11. Part of the meeting included a presentation and discussion with Yves Petroff, former director of the European Synchrotron Radiation Facility (ESRF) who is now on sabbatical at the ALS. Yves has been asked by ALS management to look at the scientific program and operation of the ALS and all its beamlines. Yves's recommendations and findings will be important and will hopefully contribute to making the ALS even more efficient and productive than it already is. A useful dialogue between him and the UEC and even more so between him and all users and beamline scientists is important. I encourage all users to discuss issues regarding their beamline or experiments at an appropriate and opportune time with Yves.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Kelly Knutsen (Univ. of California, Berkeley)
Hoi-Ying Holman (Berkeley Lab)
Upal Ghosh (Stanford Univ.)
Felicia Betancourt and Bob Glaeser (Univ. of California, Berkeley, and Berkeley Lab)

Beamline 6.3.1
Hisanobu Wakita (Fukuoka Univ., Japan)
Ron Tackaberry (Berkeley Lab)

Beamline 7.0.1
Jim Tobin (Lawrence Livermore National Laboratory)
Shirley Chiang (Univ. of California, Davis)
George Wadill (Univ. of Missouri-Rolla)
Adam Hitchcock (McMaster Univ., Canada)
Harald Ade (North Carolina State Univ.)

Beamline 7.3.1.1
David Abraham (IBM T.J. Watson Research Center)
Simone Anders (IBM Almaden Research Center)
Boris Sinkovic (Univ. of Connecticut)

Beamline 7.3.3
Yang Mo Koo, Hyungdon Joo, Jaesong Kim (Pohang Univ., South Korea)
Ersan Ustundag (California Institute of Technology)

Beamline 8.0.1
Nora Berrah (Western Michigan Univ.)
Satish Myneni (Princeton Univ.)
Glenn Waychunas (Berkeley Lab)

Beamline 9.0.2
Jinian Shu (Berkeley Lab)
Rainer Dressler (Air Force Research Laboratory)

Beamline 10.0.1
Dan Dessau (Univ. of Colorado at Boulder)
Erwin Poliakoff (Louisiana State Univ.)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of June 20 - 25, June 26 - July 1, July 3 - 9 (two-bunch mode, except July 4 holiday), and July 10 - 15 (two-bunch mode), the beam reliability (time delivered/time scheduled) was 94%. Of the scheduled beam, 90% was delivered to completion without interruption. There were two significant outages: on July 3, repair of a gradient power supply cost two shifts (17.7 hours), and on July 14, repair of the Beamline 9.3.1 hutch interlock cost 7.5 hours.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 181 August 1, 2001

Contents of This Issue:

1. NEW BEAMLINES READIED IN ANTICIPATION OF SUPERBENDS

(Contact: HAPadmore@lbl.gov)

Construction of the first "superbend" beamline (8.3.1) at the ALS has been completed and a preliminary data set has been obtained, several weeks before installation of the actual superbend magnets. This beamline is one of three new protein crystallography beamlines being added to Sector 8, where the existing bend magnet will soon be replaced by a superconducting bend magnet. A total of three superbends (the other two will be in Sectors 4 and 12) are scheduled for installation later this month, during the shutdown beginning August 20.

Superbends are an optimal x-ray source for most protein crystallography projects, providing an adequate amount of flux for a typical protein crystal (about 0.1 mm in size) at photon energies of interest (2.4 to 17 keV). Funded jointly by groups from the University of California's Berkeley (UCB) and San Francisco (UCSF) campuses, Beamline 8.3.1 will allow both multiple-wavelength anomalous diffraction (MAD) and monochromatic protein crystallography. The system is currently being commissioned with a preliminary data collection scheme, and an initial data set for myoglobin was successfully recorded on July 5. The development team consists of Alastair MacDowell, Dave Plate, Carl Cork, and James Holton. The team plans to finish basic commissioning and to take a substantial amount of data before the superbend installation shutdown. Tom Alber and Jim Berger (UCB) are the beamline spokespersons, and James Holton is the beamline contact.

Two other protein crystallography beamlines (8.2.1 and 8.2.2), funded through the Howard Hughes Medical Institute, are also under construction in Sector 8. Beamline 8.2.1 has been completed to the point where light has been delivered to the sample position. The endstation hutch is currently being assembled. Beamline 8.2.2 has been assembled up to the monochromator; the rest of the beamline will be installed this summer.

2. SYNCHROTRON SUMMER SCHOOL A SUCCESS

(Contacts: attwood@eecs.berkeley.edu, nilsson@ssrl.slac.stanford.edu)

A full roster of 36 graduate students from diverse fields (reflecting a typical synchrotron user community) spent a week's worth of cold, foggy mornings and bright, spectacular afternoons in a Berkeley classroom this summer studying what might be called "Synchrotron Radiation 101." This first-ever Berkeley-Stanford Summer School in Synchrotron Radiation was designed to introduce prospective synchrotron users to the fundamentals of synchrotron radiation, its requisite technologies, and a broad range of scientific applications.

The week-long residential program was held at UCB's Clark Kerr Campus and was sponsored by Stanford University, Berkeley Lab, Stanford Synchrotron Radiation Laboratory (SSRL), and the UCB Division of Continuing Education in Engineering. The course was coordinated by Anders Nilsson (SSRL/Stanford/Uppsala University) and David Attwood (Berkeley Lab/UCB). This first class of students was drawn from a wide range of backgrounds, from environmental science to applied chemistry and basic physics, and from as far away as Sweden, Germany, and Japan. Applicants were admitted based on their academic records, written statements describing how a knowledge of synchrotron radiation would enhance their intended research, and publications lists.

A review of the course syllabus reveals topics tailored to the interests of the group, including "X-Ray Absorption Spectroscopy: Applications in Magnetism" (Jo Stohr, SSRL), "X-Ray Speckle and Dynamic Scattering" (Steve Kevan, Univ. of Oregon Physics Dept.), and "XAFS Applications to Environmental Science" (Gordon Brown, Stanford Univ. School of Earth Sciences). Other invited instructors included Harald Ade (North Carolina State Univ. Dept. of Physics), Sean Brennan (SSRL), and Eli Rotenberg (ALS).

In addition to the lectures, the program featured extended visits to both the ALS and SSRL, where the students had the opportunity to view first-hand the technologies discussed in class and to interact with scientists actively engaged in synchrotron research. (Photos of the ALS visit can be viewed online at http://www.unex.berkeley.edu/eng/synchrotron/photos.html.)

As part of the course materials, each student received a copy of Attwood's textbook, "Soft X-Rays and Extreme Ultraviolet Radiation," and the recently updated "X-Ray Data Booklet," a popular pocket-sized reference book published by the Center for X-Ray Optics at Berkeley Lab. Each participant also received not one, but two Synchrotron Summer School t-shirts--one in Berkeley colors (blue with "Berkeley-Stanford Synchrotron Summer School" in gold lettering) and one in Stanford colors (red with "Stanford-Berkeley Synchrotron Summer School" in white lettering). Next year, the summer school will be hosted by Stanford, and organizers hope it will become an annual event, alternating between the two sites.

3. REMINDER: DEADLINE FOR USERS' MEETING ABSTRACTS IS SEPT. 10

(Contact: alsabstract@lbl.gov)

All ALS users, including students and postdocs, are invited to submit abstracts for oral or poster presentations to be presented at the annual Users' Meeting at Berkeley Lab on October 15-17, 2001. Oral presentations for the "junior researchers" and "science highlights" sessions will be selected by the committee from the abstracts received; other submissions will be presented as posters. The online submission form can be found at http://www-als.lbl.gov/als/usermtg/abstracts.html. Submission deadlines are as follows:

September 10, 2001
- to be considered for an oral presentation and/or the student poster competition
October 3, 2001
- to guarantee a space in the poster session and be included in the program booklet
October 10, 2001
- for space in the poster session on an "as available" basis

Information about the meeting program, speakers, registration, and accommodations will be posted at http://www-als.lbl.gov/als/usermtg/ as soon as it becomes available. Information about the SSRL Users' Meeting (being held the same week from Oct 17-19) can also be found online at http://www-ssrl.slac.stanford.edu/conferences/ssrl28/.

4. BEAMLINE COMMISSIONING MAY AFFECT USER SHIFTS

(Contact: GFKrebs@lbl.gov)

The introduction of superbend magnets into the ALS storage ring later this month is comparable to major surgery and may require a more extended recovery period than was initially allowed for in the schedule. Although user operations are expected to resume on October 2, users should be advised that additional beamline commissioning activities may extend through October 3. During this time, our beamline scientists will be working with the accelerator physics group to optimize beamline performance under the new conditions. Beamlines with users scheduled for the first week of operations after the shutdown will be commissioned first. In the future, we will schedule this as a routine part of commissioning following a major shutdown. Any users who miss shifts due to commissioning should rest assured that those shifts will be made up during the next running period.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Liane Benning (Univ. of Leeds, UK)
Mary Kauffman (Idaho National Engineering and Environmental Laboratory)
Tom Breunig and Dan Fried (Univ. of California, San Francisco)

Beamline 5.0.2
Glen Spraggon, Andreas Kreusch, and Kenneth Ng (Novartis Research Foundation)
Xueyong Zhu, Sumit Khurana, Yan Zhang, and John Luz (The Scripps Research Institute)
Huiying Li and Edward Z. Wen (Univ. of California, Irvine)
Hans Parge, Dan Knighton (Pfizer, Inc.)

Beamline 7.0.1
Z.Q. Qiu (Univ. of California, Berkeley)
Steve Kevan (Univ. of Oregon)

Shirley Chiang (Univ. of California, Davis)
Anders Nilsson (Uppsala Univ., Stanford Synchrotron Radiation Laboratory)
Brian Tonner (Univ. of Central Florida)

Beamline 8.0.1
Maria Novella Piancastelli (Univ. of Rome "Tor Vergata")
Marcelo Sant Anna (Univ. Federal Fluminense, Brazil)

Beamline 9.0.1
Larry Sorensen (Univ. of Washington)

Beamline 9.0.2
Andrew Yencha (State Univ. of New York at Albany)

Beamline 10.0.1
Atsushi Fujimori (Univ. of Tokyo)
Ron Phaneuf (Univ. of Nevada, Reno)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of July 18 - 23 and 24 - 29, the beam reliability (time delivered/time scheduled) was 99%. Of the scheduled beam, 98% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 182 August 15, 2001

Contents of This Issue:

1. 2001 USERS' MEETING WORKSHOPS ANNOUNCED

(Contact: alsum2001@lbl.gov)

Participants at this year's ALS Users' Meeting are invited to attend any of the six workshops scheduled after the conclusion of the regular meeting program. The workshop sessions will be held Tuesday, October 16, 8:30 a.m.-3:00 p.m. and Wednesday, October 17, 9:00 a.m.- 5:00 p.m. Workshop topics include the following:

- Advanced Detectors for Synchrotron Experiments
- Future Directions in Soft X-Ray Molecular Environmental Science
- Infrared Spectromicroscopy and Future Infrared Sources
- Macromolecular Crystallography Frontiers: More Structures with Less Beamtime
- Spectroscopies of Electronic Materials: Correlated Electrons and Nanoscale Phenomena
- SRRTNet Workshop on Theory, Computation, and Synchrotron Experiments

There is no cost to attend the workshops, but all attendees must register for the ALS Users' Meeting at http://www-als.lbl.gov/als/usermtg/registration.html, where they can indicate which workshops they plan on attending. More detailed information about individual workshops, including schedules, speakers, and contact information, is available on the Workshops Web page at http://www-als.lbl.gov/als/usermtg/workshops.html.

2. LATEST COMPENDIUM ABSTRACTS NOW ONLINE

(Contact: LSTamura@lbl.gov)

The ALS Compendium Web site (http://alspubs.lbl.gov/compendium) has been updated to include abstracts received from users for calendar year 2000. The site is a comprehensive, one-stop reference tool for finding information about the research done at the ALS since 1997. Visitors to the site can perform full-text searches of the entire abstract database, "power search" the abstracts according to several user-selected parameters (such as year, beamline, author, and title), or simply browse the abstracts by subject, beamline, or author. A PDF version of the 2000

ALS Compendium of Abstracts has also been added to the site. The CD version will be distributed in conjunction with the Activity Report to ALS users in the next few weeks.

3. REPRINTS OF "TECHNIQUES OF VUV SPECTROSCOPY" AVAILABLE
(Contact: WCStolte@lbl.gov)

First published in 1967, "Techniques of Vacuum Ultraviolet Spectroscopy" by ALS user James A.R. Samson (University of Nebraska-Lincoln) remains the only book of its kind. Reprinted in 2000 with a few corrections, this book is still an essential reference for spectroscopic studies in the ultraviolet region of the spectrum. Copies can be purchased from Cruithne Press, Glasgow, Great Britain; to obtain an order form, contact Wayne Stolte (WCStolte@lbl.gov) or the publisher (cruithne.press@virgin.net).

4. ALS JOB OPPORTUNITIES THROUGH UNLV
(Contact: lindle@nevada.edu)

The X-Ray Atomic and Molecular Spectroscopy (XAMS) Program at the University of Nevada, Las Vegas (UNLV), is seeking two to three postdoctoral scientists to participate in VUV/soft x-ray research at the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory. A more detailed description can be found online at http://www.unlv.edu/Research_Centers/Xray_Atomic_and_Molecular_Spectroscopy/job.html.

5. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE
by Harald Ade
(Contact: harald_ade@ncsu.edu)

The UEC is working on a new process to facilitate the election of its members (see charter at http://www-als.lbl.gov/als/uec/charter.html). A Web site to be used both for suggestions and voting is under development. All users will soon receive a separate email including details about the election process and a request to make suggestions about suitable UEC candidates.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next week at the ALS.

Beamline 1.4.3
T.J. Wilkinson (Berkeley Lab)
Mary Kauffman (Idaho National Engineering and Environmental Laboratory)
Felicia Hendrickson (Berkeley Lab)
Harvey Doner (Univ. of California, Berkeley)
Ted Raab (Univ. of Colorado at Boulder)

Beamline 4.0.1-2

Chuck Fadley (Univ. of California, Davis, and Berkeley Lab)

Beamline 5.0.2
Derek Piper et al. (Tularik, Inc.)
Vivian Li et al. (Amgen)
Steve Bellon et al. (Vertex Pharmaceuticals)
Tzanko Doukov and Eric Schreiter (Massachusetts Institute of Technology)
Doug Rees et al. (California Institute of Technology)
Richard Brennan and Maria Schumacher (Oregon Health and Science University)
Hartmut Luecke et al. (Univ. of California, Irvine)

Beamline 6.3.1
Piero Pianetta (Stanford Synchrotron Radiation Laboratory)

Beamline 7.0.1
Steve Kevan (Univ. of Oregon)
Joerg Schaefer (Univ. Augsburg, Germany)
Satish Myneni (Princeton Univ.)
Jeffrey Kortright (Berkeley Lab)

Beamline 7.3.1.1
Anders Nilsson (Stanford Univ., Uppsala Univ., Sweden)
Z.Q. Qiu (Univ. of California, Berkeley)

Beamline 8.0.1
Tom Callcott (Univ. of Tennessee, Knoxville)
Dave Ederer (Tulane Univ.)

Beamline 9.0.2
Jinian Shu (Berkeley Lab)
Andrew Yencha (State Univ. of New York at Albany)

Beamline 9.3.1
David McKeown (Catholic Univ. of America)

Beamline 10.0.1
Howard Bryant (Univ. of New Mexico)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of August 1 - 6 and 7 - 12, the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 91% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift

should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 183 August 29, 2001

Contents of This Issue:

1. EXAFS FROM HYDROGEN ATOMS IN WATER

(Contact: saykally@cchem.berkeley.edu)

In almost any circumstance where water plays a role, which includes most biological and environmental processes, as well as in many chemical reactions, hydrogen is ubiquitous. So, it stands to reason that locating the hydrogen atoms within molecules would be a high-priority task. It is unfortunate, therefore, that hydrogen with only one electron has been virtually impossible to detect with the conventional x-ray tools for measuring atomic structure (determining where the atoms are). But now a multi-institutional group (from the University of California, Berkeley, Lawrence Livermore National Laboratory, and the University of Washington) working at the ALS has demonstrated the ability to not only detect hydrogen by means of x-ray absorption but also measure its position in water-vapor molecules, a first step toward studying more complex samples. In this work, researchers report the first definitive measurements of the covalently bound hydrogen atom in water vapor by extended x-ray absorption fine structure (EXAFS).

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/h_exafs.html.

Publication about this research: K.R.Wilson, J.G. Tobin, A.L. Ankudinov, J.J. Rehr, and R.J. Saykally, "Extended x-ray absorption fine structure from hydrogen atoms in water," Phys. Rev. Lett. 85(20), 4289 (2000).

2. SUPERBENDS INSTALLED, COMMISSIONING TO BEGIN TODAY

(Contact: JPHarkins@lbl.gov)

The ALS shutdown is into its second week and things are proceeding exceptionally well. In the first week, all three superbend magnets were installed and aligned, two days ahead of the planned schedule. The electrical and water connections have been completed, and the controls and monitoring systems have been tested. Final inspection of the magnets is scheduled for completion today, and then the critical commissioning period, in which the accelerator is adjusted to function with the new magnets, will begin. According to the plan, the linac and booster will be started up today, the storage ring systems will be checked out tomorrow morning, and the first attempts at storing beam in the storage ring will begin tomorrow afternoon.

Accelerator physics teams will then work around the clock to get the accelerator ready for beam to users on October 4. Other items completed so far in this shutdown are the installation of an upgraded carbon filter box in the Beamline 5.0 front end, the removal of the Beamline 8.2 and 8.3 M1 mirrors for upgrades (to be reinstalled in late September), and the moving of the Sector 4 stairs and adjacent racks to make room for Beamlines 4.2 and 4.3. An upgrade of the gas cabinet ventilation system for Sectors 6 through 10 is in progress and will be completed by the end of the shutdown.

3. CAMBRIDGE PROF. HUMPHREYS GIVES SPECIAL LECTURE

What do a Monet painting, global warming, and gallium nitride have in common? They can all be tied together in an entertaining and informative talk by Colin Humphreys, Goldsmiths Professor of Materials Science at Cambridge University. Humphreys came to the Bay Area recently and was invited to give a special lecture at the ALS, where he was introduced by his Cambridge contemporary, ALS Division Deputy for Science Neville Smith. Humphreys' audience got a sense of his irrepressible and irreverent style through Neville's description of the distinguished professor's widely publicized research on the best way to eat spaghetti, which included an analysis of the "escape velocity" of spaghetti sauce.

The real meat of the talk, however, involved the materials science of light-emitting diodes (LEDs) and their associated ohmic contacts. According to Humphreys, light bulbs made from gallium nitride (GaN) LEDs consume 10% of the energy required by incandescent light bulbs and last 100 times as long. As a real-world example of the potential impact of this technology, Humphreys cited the city of Denver, which is in the process of putting GaN LEDs into all of its 13,000 traffic lights. The resulting power conservation, he said, would reduce emissions of carbon dioxide (a greenhouse gas implicated in global warming) by 17 million pounds each year, the equivalent of planting a 2000-acre forest in downtown Denver. As for the Monet reference--Humphreys opened the talk with an ironically beautiful depiction of the effects of pollution: a slide of a Monet painting of Waterloo Bridge in London seen through smog-diffused sunlight.

4. RAPID ACCESS FOR PROTEIN CRYSTALLOGRAPHY IN THE WORKS

(Contact: NVSmith@lbl.gov, GFKrebs@lbl.gov)

The ALS is considering a major overhaul of its procedure for reviewing and allocating beamtime for protein crystallography proposals. The present system is cumbersome and, in some cases, more than a year can elapse between submission of a proposal and receipt of beamtime. To get this interval down to a few months, a new rapid-access procedure is being developed. The new procedure would allow the submission of independent investigator proposals at any time rather than just twice a year. Once a month, the new proposals would be peer reviewed and scored, and those scoring highest would be allocated beamtime over the next few months. Proposals not receiving beamtime would remain active for three months. An email requesting input on this procedure has been sent to all Beamline 5.0.2 users. If there are no serious objections, the ALS hopes to implement the plan starting with allocations in 2002. The proposed plan can be seen online at http://www-als.lbl.gov/als/PXrapidsub/. Comments are welcome and can be sent to pxproposals@lbl.gov.

5. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user run of August 14 - 20, the beam reliability (time delivered/time scheduled) was 98%. Of the scheduled beam, 95% was delivered to completion without interruption. There were no significant outages. The ALS is currently in a planned shutdown for installations and maintenance. User operations are scheduled to resume at 12:00 a.m. on Thursday, October 4, 2001.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 184 September 12, 2001

Contents of This Issue:

1. ZOOMING IN ON RIBOSOMES

by Annette Greiner
(Contact: harry@nuvolari.ucsc.edu)

The structure of the ribosome--the site for the crucial process of turning genetic code into functional proteins--is coming into focus, and the work has been advanced considerably by a team from the University of California, Santa Cruz. Working at the Macromolecular Crystallography Facility (MCF) at the ALS (Beamline 5.0.2), this team has determined the structure of the ribosome with bound messenger RNA (mRNA) and transfer RNA (tRNA) at 5.5-angstrom resolution. This work builds on the group's previous efforts at the MCF, in which they solved the structure to 7.8 angstroms. Among the new observations is structural evidence that the two main parts of the ribosome (the 30S and 50S subunits) move relative to each other during protein synthesis. The new view also offers insight into how the ribosome interacts with tRNA.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/45ribosome.html.

Publication about this research: M.M. Yusupov, G.Zh. Yusupova, A. Baucom, K. Lieberman, T.N. Earnest, J.H.D. Cate, and H. F. Noller, "Crystal Structure of the Ribosome at 5.5 Angstrom Resolution," Science 292, 883 (2001).

2. SUPERBEND MILESTONE: BEAM STORED SUCCESSFULLY

(Contact: CSteier@lbl.gov)

At 1:00 a.m. on Friday, August 31, the ALS storage ring held a beam of electrons for the first time with three superbend magnets in place. This milestone in ALS history occurred just hours after the superbend project entered the commissioning phase and only five minutes after the first injection attempt. An hour later, the current in the storage ring was increased to 100 mA (current limited by vacuum) at 1.5 GeV. By Friday afternoon, the energy was ramped to 1.9 GeV, and by Wednesday, September 5, the current reached 400 mA at 1.9 GeV.

Teams of accelerator physicists, engineers, and operators have been working around the clock to test and characterize the machine performance with the superbends in action. The Accelerator Physics Group reports that, so far, the injection rate and beam orbit stability are the same as they were before the shutdown. Also, the dynamic properties (dynamic aperture and momentum acceptance) are similar to what they were before, indicating that, once the vacuum improves, the presence of the superbends should not have a negative impact on beam lifetime. Initial values of the horizontal emittance and coupling look reasonable as well. The bottom line, according to Accelerator Physics Group Leader David Robin, is that, although there is a lot of work still ahead, commissioning is going remarkably well and is progressing faster than expected.

3. USERS' MEETING ABSTRACT INITIAL DEADLINE EXTENDED

(Contact: alsum2001@lbl.gov)

All ALS users, staff, students, and postdocs now have until Thursday, September 13, to submit abstracts of their recent work to be considered for an oral presentation and/or the student poster competition at this year's ALS Users' Meeting. From this pool of abstracts, the meeting's Program Committee will select several for oral presentations during the Young Researchers session on Monday, October 15. The student poster competition will be judged during the general poster session on Tuesday, October 16. Awards for the student posters will be presented during the Tuesday evening dinner. For more information about abstract submissions and forms, see the Abstract Submissions Web page at http://www-als.lbl.gov/als/usermtg/abstracts.html.

4. CALL FOR ALS USERS' MEETING AWARD NOMINATIONS

Each year, the ALS Users' Executive Committee (UEC) presents awards to scientists and staff who have made significant contributions to the ALS scientific and user support programs. This year, the UEC invites ALS users and staff to submit nominations for any or all of the following awards:

- David A. Shirley Award for Outstanding Scientific Achievement at the Advanced Light Source
- Halbach Award for Innovative Instrumentation at the Advanced Light Source
- Tim Renner User Services Award

The nominations may be for an individual or a group, and a brief rationale for the nomination(s) is required. Past award winners, along with a representative from the UEC and the ALS, will serve on the award selection committees. To submit a nomination, go to the 2001 ALS Users' Meeting Award Nominations Web page at http://www-als.lbl.gov/als/usermtg/awards/nominations.html. The deadline for nominations is Monday, October 1. The awards will be presented at the ALS Users' Meeting dinner/buffet on Tuesday, October 16.

5. CONGRATULATIONS TO FIRST ALS FELLOWSHIP RECIPIENTS

(Contact: ZHussain@lbl.gov)

The ALS is extremely pleased to announce the first five recipients of ALS Doctoral Fellowships: Alejandro Aguilar, Henry Chong, Steven Johnson, Cynthia Morin, and Kevin Wilson. These exceptional Ph.D. students have been selected to perform a major part of their thesis work at the ALS during a one-year appointment covering the 2001-2002 academic year. Alejandro Aguilar (Univ. of Nevada, Reno) will be developing ion spectroscopy capabilities at Beamline 10.0.1. Henry Chong (Univ. of California, Berkeley) plans to do femtosecond x-ray spectroscopy with a slicing source at Beamline 5.3.1, and Steven Johnson (Univ. of California, Berkeley) will also perform femtosecond x-ray spectroscopy experiments, but with a streak camera at both Beamlines 5.3.1 and 7.3.3. Cynthia Morin (McMaster Univ., Canada) will be characterizing protein interactions with biomaterials at Beamlines 7.0.1 and 5.3.2. Kevin Wilson (Univ. of California, Berkeley) will perform x-ray spectroscopy experiments on liquid microjets at Beamlines 8.0.1 and 9.3.2. Congratulations to all five! The selection committee consisted of Harald Ade, David Attwood, Steve Kevan, and Neville Smith. Detailed information about the fellowships, along with links to frequently asked questions and the application form, can be found at http://www-als.lbl.gov/als/fellowships/index.html.

6. REMINDER: USER PUBLICATIONS DUE SEPTEMBER 21

(Contact: alsuser@lbl.gov)

If you have recently published any ALS-related work in a scientific journal, conference proceedings, or Ph.D. thesis, please let us know (if you haven't already) by going to the User Services Online Forms Web page at http://alsusweb.lbl.gov. Click on the "Publications Search & Submittal" link. Please DO NOT submit unpublished talks; abstracts; or journal articles that are still "submitted," "accepted," or "in press." The deadline for this year is September 21, 2001. Your timely response will be greatly appreciated, as it is imperative that we accurately report the number of ALS-related publications, an important measure of the good science being done at this facility.

7. NEXT ISSUE: OCTOBER 3

Because a majority of the ALS's editorial staff will be on travel to a conference for most of the week leading up to the next scheduled issue, we have decided to delay publication of ALSNews by one week. The next issue will be distributed three weeks from today, on October 3.

8. OPERATIONS UPDATE

The ALS is currently in a planned shutdown for installations and maintenance. User operations are scheduled to resume at 12:00 a.m. on Thursday, October 4, 2001.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

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ALSNews Vol. 185 October 3, 2001

Contents of This Issue:

1. SUPERBENDS AT THE ALS: A PERFECT FIT

by Lori Tamura

One by one, the pieces fell into place. Slowly but surely, the story lines converged. The development of superconducting bend magnets ("superbends"), intended to expand the capabilities of the ALS in general, dovetailed neatly with the extraordinary growth of protein crystallography research in recent years. The superbends will allow up to 12 new beamlines of intermediate energy (from 7 to 40 keV) without sacrificing the quality or quantity of light available at the lower energies. This will be more than enough to accommodate the fast-growing protein crystallography community and to provide complementary diffraction, spectroscopy, and imaging capability for materials science in the higher energy range. Superbends, in other words, are tailor-made for the future of the ALS. When the superbend-enhanced ALS starts up for user operations this week, it will mark the beginning of a new era in its history. It will be a testament to the vision, ingenuity, and dedication of the multitude of people who contributed over the course of many years to this resounding success story.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/superbend.html.

2. NONLINEAR X-RAY SPECTROSCOPY: EXPERIMENTS FOR THE FUTURE

Shaul Mukamel, the C.E. Kenneth Mees Professor of Chemistry at the University of Rochester and a 1997 Humboldt Award recipient, presented a colloquium at the ALS on August 30, 2001, titled "Ultrafast Nonlinear X-Ray Spectroscopy of Molecules: Theoretical Challenges." Professor Mukamel has developed novel ways to observe and interpret molecular dynamics using fast (optical) laser pulses. His book, "Principles of Nonlinear Optical Spectroscopy," is widely used as that field's standard text. The formalism described therein can be used to explain the dynamics of various systems, including molecules, molecular crystals, semiconductors, and strongly correlated materials. In the colloquium, he outlined recent efforts to generalize these nonlinear optical spectroscopy methods to include the x-ray regime and described several relevant x-ray spectroscopy experiments that could be performed in the future, perhaps at a facility such as the ALS.

Professor Mukamel pointed out that nonlinear x-ray spectroscopy experiments can reveal all the electronic states, while simultaneously providing control over which atoms are excited. This allows us to obtain wave-function information that cannot be obtained by using optical spectroscopy alone. He cited several examples of optical pump/x-ray probe experiments that might be carried out on molecules of interest, such as nitroanilene isomers, molecular dendrimers, one-dimensional chains of mixed-valence compounds, and porphyrin assemblies. When asked what kind of x-ray source would provide the maximum information, Mukamel replied that a 10-fs x-ray source would be needed for performing resonant, nonlinear, purely x-ray time-domain experiments, but admitted that this may not be available for a while. Until then, he said, there is still a lot to be done, even with current technology. He concluded by saying that there is a lot of interesting physics to be done in the 100- to 200-fs range by combining optical and x-ray pulses, and that it will be a very nice challenge for theorists and experimentalists to work together to interpret these experiments.

3. ALS USERS' MEETING UPDATE: DEADLINES EXTENDED

(Contact: alsum2001@lbl.gov)

The early-registration deadline for the ALS Users' Meeting has been extended to Monday, October 8. Register now online at http://www-als.lbl.gov/als/usermtg/registration.html to receive the reduced fee rate of $150.00 (regular) and $60.00 (student). After October 8, the regular and student fees increase to $175.00 and $75.00, respectively.

Nominations for the Halbach Award for Innovative Instrumentation, the David A. Shirley Award for Scientific Achievement, and the Tim Renner User Services Award will continue to be accepted until Monday, October 8. Award nominations can be submitted over the Web at http://www-als.lbl.gov/als/usermtg/awards/nominations.html. The awards will be presented during the ALS Users' Meeting dinner on the evening of Tuesday, October 16.

In other meeting news, an up-to-date meeting program, workshop agendas, and a listing of the exhibitors of synchrotron-related equipment attending this year's meeting have been posted on the Users' Meeting Web site (http://www-als.lbl.gov/als/usermtg). Finally, it is still not too late to submit an abstract for the poster session on Tuesday, October 16. Abstracts can be submitted over the Web at http://www-als.lbl.gov/als/usermtg/abstracts.html. The poster session will take place concurrently with the student poster competition, vendor exhibits, and a reception/dinner on the ALS patio on Tuesday from 3:00 p.m. to 7:00 p.m.

4. ALS WELL REPRESENTED IN UPCOMING SRMS-3 CONFERENCE

(Contact: HAPadmore@lbl.gov)

The Third International Conference on Synchrotron Radiation in Materials Science (SRMS-3) will be held in Singapore on January 21-24, 2002. The SRMS conference series comprehensively covers the intersection between materials science and engineering on one hand, and synchrotron radiation, facilities, and instrumentation on the other. SRMS-3 is being sponsored by the Singapore Synchrotron Light Source (SSLS) and the National University of Singapore. Howard Padmore of the ALS is on the International Advisory Committee, and several of the invited speakers are associated with the ALS. Nobumichi Tamura (ALS) will give

a talk about using microdiffraction to study stress distributions in thin films on a microscale. Hendrik Ohldag (Stanford Synchrotron Radiation Laboratory) will discuss ferromagnetic/antiferromagnetic coupling of thin films studied with XPEEM. Jeffrey Kortright (Berkeley Lab, Materials Sciences Division) will address soft x-ray scattering applied to magnetic materials. Gerd Schneider (Berkeley Lab, Center for X-Ray Optics) will talk about electromigration in copper interconnects. The deadline for abstract submission is October 15, 2001. For more information, visit the conference Web site at http://ssls.nus.edu.sg/srms.html.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
T.J. Wilkinson (Berkeley Lab)
Harvey Doner (Univ. of California, Berkeley)
Tom Breunig and Dan Fried (Univ. of California, San Francisco)

Beamlines 5.0.1, 5.0.2, and 5.0.3
James Berger (Univ. of California, Berkeley)
Peter Hwang (Univ. of California, San Francisco)
Sung-Hou Kim et al. (Berkeley Structural Genomics Center, Berkeley Lab)
Partho Ghosh (Univ. of California, San Diego)
Kathryn Ely (The Burnham Institute)

Beamline 6.3.1
Yasuji Muramatsu (Japan Atomic Energy Research Institute)
Hisanobu Wakita (Fukuoka Univ., Japan)

Beamline 7.0.1
Z. Q. Qiu (Univ. of California, Berkeley)
Steve Kevan (Univ. of Oregon)
Elaine Seddon (Daresbury Laboratory, UK)
Jinghua Guo (Berkeley Lab)
Harald Ade (North Carolina State Univ.)
Jeffrey Kortright (Berkeley Lab)

Beamline 8.0.1
Satish Myneni (Princeton Univ.)
Richard Saykally (Univ. of California, Berkeley)

Beamline 9.3.2
Dario Arena (Brookhaven National Laboratory)
Glenn Waychunas (Berkeley Lab)

Beamline 10.0.1
Ron Phaneuf (Univ. of Nevada, Reno)

6. OPERATIONS UPDATE

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LBNL/PUB-848
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ALSNews Vol. 186 October 17, 2001

Contents of This Issue:

1. ROLE OF LATTICE VIBRATIONS IN SUPERCONDUCTIVITY

by Art Robinson
(Contacts: alessa@stanford.edu, zxshen@stanford.edu)

The mechanism responsible for high-temperature superconductivity remains elusive. The observation of spectral features occurring at a characteristic energy (an energy scale) often provides significant insight into physical processes in the material. Now, an international collaboration between researchers from Stanford University, the University of Tokyo, and the ALS has evidence from high-resolution angle-resolved photoemission spectroscopy (ARPES) for a common energy scale in three different families of high-temperature superconductors. Several chains of evidence argue that, in contrast to most recent thinking, lattice vibrations must have a role in the superconductivity in these materials.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/48lattice_vibration.html.

Publication about this research: A. Lanzara, P.V. Bogdanov, X.J. Zhou, S.A. Kellar, D.L. Feng, E.D. Lu, T. Yoshida, H. Eisaki, A. Fujimori, K. Kishio, J.I. Shimoyama, T. Noda, S. Uchida, Z. Hussain, and Z.X. Shen, "Evidence for Ubiquitous Strong Electron-Phonon Coupling in High-Temperature Supereconductors," Nature 412, 510 (2001).

2. SAWATZKY ON SPIN, CHARGE, AND ORBITAL DEGREES OF FREEDOM

Professor George Sawatzky, Canada Research Chair in Condensed Matter Physics at the University of British Columbia (UBC), gave a colloquium at the ALS on October 11. ALS colloquia are given by distinguished scientists who are periodically invited to speak on various subjects of interest to the ALS community. Professor Sawatzky, who recently moved to UBC from the University of Groningen in the Netherlands, is one of Europe's most respected scientists in condensed matter physics and a much-sought-after speaker at international conferences. His work relies on sensitive spectroscopic methods to study electronic structure and motion in nanostructured solids. He has developed a description of the electronic properties of solids that

combines the best of quantum chemistry and correlated electron physics. The resulting ideas lead to powerful new techniques for exploring many modern solid-state science issues, including the development of high-temperature superconductors, manganese oxide colossal magnetoresistant (CMR) materials, transition metal compounds, and molecular devices.

In his talk at the ALS, Prof. Sawatzky explored the interplay between spin, charge, and orbital degrees of freedom in strongly correlated systems. Examples of such systems include CMR materials, "frustrated systems" whose structures allow an infinite number of energetically equivalent ordered states, and systems with strange magnetic behavior (e.g., where the magnetic moment finds itself lined up antiparallel to an applied field). Phase diagrams for such systems are very complex, and experiments indicate that, at the phase transitions, a kind of dynamic phase separation occurs in the form of bubbles, stripes, globs, and lines. These phenomena and the time scales of their fluctuations present very interesting open questions in which Prof. Sawatzky believes soft (resonant) x-ray scattering will play an extremely important role. At wavelengths on the order of 10 to 20 angstroms and at resonance, he said, x-ray scattering will be extremely sensitive to spin, charge, orbital, and lattice degrees of freedom. Not only can such experimental techniques help us understand the exotic systems described above, but they can also be used to take a second look at "well understood" systems such as nickel oxide and vanadium trioxide, where surprising new insights into the actual physics behind their properties have already been obtained.

3. DOE'S DECKER DEDICATES SUPERBENDS

James Decker, acting director of the U.S. Department of Energy (DOE) Office of Science, offered his congratulations and thanks to ALS leaders and staff in a small dedication ceremony Thursday, October 4, the first full day of user operations with superbends in the storage ring. Decker commented that the ALS has had a truly admirable record of scientific productivity, and he believes that the superbends will generate a new surge in productivity, particularly in subjects relevant to Office of Science focus areas, such as nanoscience and genomics. The successful incorporation of superbends, he said, has changed the way the world thinks about third-generation light sources. After the remarks, the DOE delegation assembled at Beamline 8.3.1, the first superbend beamline to be completed, to hear beamline spokesperson Tom Alber (Univ. of California, Berkeley) describe some of its features and to get a glimpse of superbend light on a monitor. The visit to the ALS was part of DOE's annual On-Site Review of Berkeley Lab's scientific and operations programs. Also attending were DOE Oakland Operations Office Manager Camille Yuan-Soo Hoo and Berkeley Site Office Manager Dick Nolan.

4. UEC ELECTIONS TO BE CONDUCTED ELECTRONICALLY
(Contact: ALRobinson@lbl.gov)

The election of new members to the ALS Users' Executive Committee (UEC) will be conducted online this year following the conclusion of the annual ALS Users' Meeting this week. The election Web site, which provides details about the election process, can be found at http://www-als.lbl.gov/als/uec/vote/. The following candidates have been nominated to fill three regular seats: Felicia Hendrickson Betancourt (Berkeley Lab), Ali Belkacem (Berkeley Lab), John Bozek (ALS), Michael C. Martin (ALS), Alexander Moewes (Univ. of Saskatchewan), Yasuji

Muramatsu (Japan Atomic Energy Research Institute), Ronald A. Phaneuf (Univ. of Nevada, Reno), Z.Q. Qiu (Univ. of California, Berkeley, and Berkeley Lab), Eli Rotenberg (ALS), and Tony van Buuren (Lawrence Livermore National Laboratory). In addition, Alejandro Aguilar (Univ. of Nevada, Reno) and Sophie E. Canton (Western Michigan Univ. and ALS) have been nominated for the student/postdoc seat. Biographical information for each nominee will be posted on the election Web site as soon as it becomes available. The newly elected members will take office on January 1, 2002, and serve on the committee for three years.

5. FIRST CALL: GENERAL SCIENCES PROPOSALS DUE DECEMBER 1

(Contact: alsproposals@lbl.gov)

The User Services Office is now accepting proposals from scientists who wish to conduct research as independent investigators in the general sciences during the running period from June to November 2002. The deadline for submissions is December 1, 2001. (This information does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must fill in a one-page Experiment Report/Beamtime Request and submit it to the User Services Office by the December 1 deadline. The numeric rating for each proposal will be communicated to the investigator along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

Independent investigator process
http://www-als.lbl.gov/als/quickguide/independinvest.html

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

6. RESULTS OF SECOND POLL ON REFILL TIMES

(Contact: B_Feinberg@lbl.gov)

The results of the second user poll on storage-ring refill times are in. The users showed an overwhelming preference for the eight-hour, fixed-time option (96 votes) compared to the six-hour, variable-time option (35 votes). There was no significant preference regarding the start time (either 7 a.m. or 9 a.m). The ALS operators have suggested a 9 a.m. start time, because it means that refills will generally occur near the beginning of their shifts, when they are fresh.

Accordingly, after going over these results with the Strategic Management Team, we have started the new fiscal year (which begins October 1) using an eight-hour, fixed-time schedule, with refills at 9 a.m., 5 p.m., and 1 a.m.

7. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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Harvey Doner (Univ. of California, Berkeley)
Upal Ghosh (Stanford Univ.)
Hoi-Ying Holman (Berkeley Lab)
Felicia Betancourt (Berkeley Lab)

Beamline 4.0.1-2
Jeffrey Kortright (Berkeley Lab)
Boris Sinkovic (Univ. of Connecticut)
George Waddill (Univ. of Missouri-Rolla)

Beamlines 5.0.1, 5.0.2, and 5.0.3
Dong Hae Shin, Jeroen Brandsen, and Ursula Schulze-Gahmen (Berkeley Structural Genomics Center)
Hideaki Shimizu, B. Bhakar, Latesh Lad, Mack Flinspach, and Jonathan Friedman (Univ. of California, Irvine)
Xiaoping Dai and Yu An (The Scripps Research Institute)
Glen Spraggon, Andreas Kreusch, Scott Lesley, and Chris Lee (Novartis Institute for Functional Genomics)
Ray Stevens, Mike Hanson, and Michael Bracey (The Scripps Research Institute)
Duncan McRee (Syrrx, Inc.)
Rune Hartmann (The Cleveland Clinic Foundation)
Clare Peters-Libeu (J. David Gladstone Institutes)
Brian Chapados, Timothy Wood, Li Fan, Gabriel Moncalian (The Scripps Research Institute)

Beamline 6.3.1
Yasuji Muramatsu (Japan Atomic Energy Research Institute)
Hisanobu Wakita (Fukuoka Univ., Japan)
Maurizio Sacchi (Univ. Paris-Sud)

Beamline 7.0.1
Z. Q. Qiu (Univ. of California, Berkeley)
Elaine Seddon (Daresbury Laboratory, UK)
Jinghua Guo (Berkeley Lab)
Joseph Nordgren (Uppsala Univ., Sweden)
Jeffrey Kortright (Berkeley Lab)

Beamline 7.3.3
Ersan Ustundag (California Institute of Technology)

Beamline 8.0.1
Ernst Kurmaev (Russian Academy of Sciences)

Beamline 9.3.2
David Shuh (Berkeley Lab)
Hendrik Bluhm (Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany)

Beamline 10.0.1
Andrew Yencha (State University of New York, Albany)

8. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of October 4 - 8 (1.5 GeV) and 9 - 15 (1.9 GeV), the beam reliability (time delivered/time scheduled) was 91%. Of the scheduled beam, 75% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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ALSNews is a biweekly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

http://www-library.lbl.gov/teid/tmRco/howto/RcoBerkeleyLabDisclaimer.htm
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ALSNews Vol. 187 October 31, 2001

Contents of This Issue:

1. SPECTRA OF ANIONIC FRAGMENTS VERIFY SHAPE RESONANCES

by Art Robinson
(Contacts: WCStolte@lbl.gov, lindle@nevada.edu)

Shape resonances are a controversial subject among molecular spectroscopists, in part because there has been no agreed-upon way even to identify them when they occur, which is thought to be rather frequently in both gas-phase and adsorbed molecules. So it is good news that an international team at the ALS comprising researchers from the U.S., Italy, Mexico, and Sweden has discovered a method for verifying their presence. The team's approach, demonstrated in carbon monoxide, is to measure the yields of both cation and anion fragments above the molecular photoionization threshold. They showed that, unlike cation spectra, the anion spectra do not contain the shape resonance, whose energy is well known in this molecule. Measuring both therefore pinpointed the shape resonance.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/49anionic_fragment.html.

Publication about this research: W.C. Stolte, D.L. Hansen, M.N. Piancastelli, I. Dominguez Lopez, A. Rizvi, O. Hemmers, H. Wang, A.S. Schlachter, M.S. Lubell, and D.W. Lindle, "Anionic Photofragmentation of CO: A Selective Probe of Core-Level Resonances," Phys. Rev. Lett. 86, 4503 (2001).

2. ALS USERS' MEETING SETS ATTENDANCE RECORD

by Art Robinson
(Contact: harald_ade@ncsu.edu)

Sponsored by the Users' Executive Committee (UEC) and spread over three days from October 15-17, the annual ALS Users' Meeting featured an exceptional program with quality science as the main theme. While the first day was reserved for the traditional facility and Washington reports and for science highlights, the following two days, devoted to several workshops covering topics from theory to detectors, new experimental facilities, and forefront science, were strong draws. As a result, it should not be surprising that the number of registered attendees

jumped to a record level of 352, more than 100 above the typical attendance in recent years. The arrival of superconducting bend magnets, or superbends, just before the meeting opened also helped stimulate interest.

Read the full story (with photos) at http://www-als.lbl.gov/als/usermtg/highlights.html.

3. GROUP TO ANALYZE NEW YORK AIR SAMPLES AT ALS

(Contact: tacahill@ucdavis.edu)

The fallout from the collapse of the World Trade Center towers in New York City includes concern about airborne pollutants that could affect recovery workers and residents of the surrounding area. The U.S. Environmental Protection Agency, via the Department of Energy, called on the DELTA Group (Detection and Evaluation of Long-Range Transport of Aerosols), from the Univ. of California, Davis, to help monitor the composition and movement of smoke and dust particles from the excavation site. Since October 1, a Davis Rotating Unit for Monitoring (DRUM) has been positioned on the roof of a building downwind from ground zero, collecting air samples continuously; sampling will continue as long as needed. In early November, the first batch of samples will be shipped back to California for analysis.

At UC Davis, the air samples will be scanned using an electron microscope and a mass spectrometer for asbestos and organic compounds such as carcinogenic nitrosamines, polycyclic aromatic hydrocarbons, and phthalates produced when plastic burns. The x-ray microprobe at ALS Beamline 10.3.1 will be employed to analyze the samples for the presence of elements sodium through uranium, but especially for toxic metals such as mercury, lead, and cadmium. The analysis will be able to detect rarely measured, very fine and ultrafine (to 0.09 micrometer) particles that can lodge deeply in the lungs. The first set of results are expected by mid-November. Details about the composition of airborne particles should help authorities determine what safety measures are needed at the site, the length of work shifts, and whether workers need better measures to control the dust to protect local residents.

4. NEW PROTEIN CRYSTALLOGRAPHY PROCESS IN PLACE

(Contact: pxproposals@lbl.gov)

Two months ago, the ALS proposed to overhaul its procedure for allocating beamtime for independent investigators in protein crystallography (ALSNews Vol 183). The old system was cumbersome and, in some cases, more than a year could elapse between submission of a proposal and receipt of beamtime. Having solicited user input, the ALS now has a process in place that should greatly streamline the allocation process.

On October 19, an email was sent to all ALS protein crystallography users describing the changes. Essentially, old proposals that were previously in the queue became inactive, and independent investigators were asked to submit new proposals using a minimal web-based proposal form (http://alsusweb.lbl.gov/). The first deadline for the new proposals is November 15. The proposals on file on that date will be examined and scored by our Proposal Study Panel. The ranking will be used for beamtime allocations in January and February 2002. The process

will then be repeated every month with deadlines occurring on the 15th or the first working day thereafter.

We trust that there will not be too many teething problems with our new beamtime allocation process and that everyone will find that the new process will enable more rapid access to our crystallography beamlines. Should you have any questions please contact Bernie Dixon (pxproposals@lbl.gov or 510-486-6722).

5. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

Please remember to vote for the new UEC representatives at http://www-als.lbl.gov/als/uec/vote/index.html. The online election process requires the input of your ALS ID number and an email address to prevent unauthorized voting. Your vote itself will be kept totally anonymous.

6. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
T.J. Wilkinson (Berkeley Lab)
Felicia Betancourt (Berkeley Lab)
Tom Breunig and Dan Fried (Univ. of California, San Francisco)

Beamline 4.0.1-2
Jo Stohr (Stanford Synchrotron Radiation Facility)
Frithjof Nolting (Paul Scherrer Institut)
George Waddill (Univ. of Missouri-Rolla)

Beamlines 5.0.1, 5.0.2, and 5.0.3
Salem Faham, Sarah Yohannan, Duilio Cacio, Huiying Li, Michael Sawaya (Amgen)
Bing Jap, Young Do Kwon, B.G. Han (Berkeley Lab)
Barry Stoddard, Eric Galburt, Brett Chevalier, Clint Spiegel, Peter Rupert (Fred Hutchinson Cancer Research Center)
Bill Weis, Jason Davies, Sabine Pokutta, Hadar Feinberg (Stanford Univ.)
Chu-Toung Kim and Sheryl Tsai (Univ. of California, San Francisco)
Tzanko Doukov and Catherine Drennan (Massachusettss Institute of Technology)

Beamline 6.1.2
Peter Fischer (Max Planck Institute, Stuttgart, Germany)
Hermann Stoll (Max Planck Institute, Stuttgart, Germany)
Denys Usov (Institue for Polymer Research, Dresden, Germany)

Beamline 6.3.1
Clemens Heske (Univ. Wuerzburg, Germany)

Beamline 6.3.2
Sasa Bajt (Lawrence Livermore National Laboratory)
Eberhard Spiller (Lawrence Livermore National Laboratory)
David Windt (Bell Laboratories)

Beamline 7.0.1
Steve Kevan (Univ. of Oregon)
Robert Bartynski (Rutgers Univ.)
Joseph Nordgren (Uppsala Univ., Sweden)
Karsten Horn (Fritz-Haber-Institute, Germany)
Brian Tonner (Univ. of Central Florida)

Beamline 8.0.1
Kevin Prince (Sincrotrone Trieste, Italy)
Manfred Neumann (Univ. Osnabrueck, Germany)
Eberhard Umbach (Univ. Wuerzburg, Germany)

Beamline 9.3.2
Allen Johnson (Univ. of Nevada, Las Vegas)

Beamline 10.0.1
John West (Daresbury Laboratory)

Beamline 10.3.2
Dale Sayers (North Carolina State Univ.)
Alain Manceau, Frederic Panfili, Geraldine Sarret (Univ. Joseph Fourier, France)

7. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of October 17 - 22 and 23 - 28, the beam reliability (time delivered/time scheduled) was 92%. Of the scheduled beam, 77% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

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ALSNews Vol. 188 November 14, 2001

Contents of This Issue:

1. MODIFIED MAGNETISM AT BURIED INTERFACES

by Art Robinson
(Contact: JBKortright@lbl.gov)

As we enter into the era of nanoscience, where effects due to surfaces and interfaces often dominate, researchers more than ever need experimental techniques that allow them to discriminate between what goes on at the boundaries and in the interior of nanostructures. A team of two Berkeley Lab materials scientists has used x-ray standing waves generated with circularly polarized soft x rays at the ALS to do just that for palladium/cobalt/palladium trilayers similar to those that exhibit perpendicular magnetic anisotropy (PMA). With their technique, the two researchers demonstrated quantitatively that the magnetic properties at a palladium/cobalt interface differed from those in the center of the cobalt layer. Other groups are already adopting this approach in their own studies of buried interfaces in nanolayer structures.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/50magnetism.html.

Publication about this research: S.-K. Kim and J. B. Kortright, "Modified Magnetism at a Buried Co/Pd Interface Resolved with X-Ray Standing Waves," Phys. Rev. Lett. 86, 1347 (2001).

2. UEC ELECTION DEADLINE EXTENDED TO NOVEMBER 18

(Contact: harald_ade@ncsu.edu)

The deadline for voting in the Users' Executive Committee (UEC) election has been extended to Sunday, November 18. All ALS users should cast their votes online at http://www-als.lbl.gov/als/uec/vote/index.html. You will be asked to provide your ALS ID number and an email address to prevent unauthorized voting. The election is being held to select three regular representatives and one student/postdoc representative to serve three-year terms on the UEC starting in 2002. Short biographic sketches of the candidates can be found at the voting site.

3. DIGNITARIES FROM REPUBLIC OF CONGO VISIT ALS

A delegation from the Republic of Congo visited the ALS last week to learn about research and educational opportunities at the facility. The group, which included Pierre Nzila, Minister of Education, Henri Ossebi, Education Advisor to the President, and Charles Gombe Mbalawa, Chancellor of the Marien Ngouabi University and Director General of the University Hospital Center, Brazzaville, was given an introduction to the ALS by Deputy Division Director Ben Feinberg before touring the x-ray microscope at Beamline 6.1.2. Beamline scientist Greg Denbeaux showed the visitors several examples of recent research in materials and biological sciences. Following a brief tour of the ALS experiment floor, Michael Barnett of the Physics Division gave an overview of QuarkNet, an educational Web site for high school students and their teachers, and Elizabeth Moxon discussed educational outreach activities at the ALS.

4. REMINDER: GENERAL SCIENCES PROPOSALS DUE DECEMBER 1

(Contact: alsproposals@lbl.gov)

The User Services Office is still accepting proposals from scientists who wish to conduct research as independent investigators in the general sciences during the running period from June to November 2002. The deadline for submissions is December 1, 2001. (This information does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must fill in a one-page Experiment Report/Beamtime Request and submit it to the User Services Office by the December 1 deadline. The numeric rating for each proposal will be communicated to the investigator along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

Independent investigator process
http://www-als.lbl.gov/als/quickguide/independinvest.html

Beamline information
http://www-als.lbl.gov/als/als_users_bl/datasheets.html
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Kelly Knutsen (Univ. of California, Berkeley)

Upal Ghosh (Stanford Univ.)
Ted Raab (Carnegie Institution of Washington)
Felicia Betancourt (Berkeley Lab)
David Sigee (Univ. of Manchester)

Beamline 4.0.1-2
Jo Stohr (Stanford Synchrotron Radiaion Laboratory)
Hendrik Ohldag (Stanford Univ. and Berkeley Lab)
Andreas Scholl (Berkeley Lab)
Steve Cramer (Univ. of California, Davis, and Berkeley Lab)
Tobias Funk (Berkeley Lab)
Hongxin Wang (Univ. of California, Davis, and Berkeley Lab)
Stephan Friedrich (Lawrence Livermore National Laboratory)

Beamlines 5.0.1, 5.0.2, and 5.0.3
Steve Bellon and Wuyi Meng (Vertex Pharmaceuticals Inc.)
Julian Chen, Peter Nollert, Bill Harries, Sherry Laporte, Sabine Borngraeber, Mary Jane Budny, Maia Vinogradova, Pan Hu (Univ. of California, San Francisco)
Weiru Wang, Dong Hae Shin, Shengfeng Chen (Berkeley Structural Genomics Center)
Jenny Stamos, Sarah Hymowitz, Matthew Franklin, Charlie Eigenbrot (Genentech, Inc.)
Karolin Luger, Rajeswari Edayathumangalam, Uma Muthurajan (Colorado State Univ.)
Mike Hanson and Michael Bracey (The Scripps Research Institute)
Glen Spraggon and Andreas Kreusch (Genomics Institute of the Novartis Research Foundation)

Beamline 7.0.1
Karsten Horn (Fritz-Haber-Institute, Germany)
Robert Bartynski (Rutgers Univ.)
Brian Tonner (Univ. of Central Florida)
Harald Ade (North Carolina State Univ.)

Beamline 9.3.2
Miquel Salmeron (Berkeley Lab)

Beamline 10.0.1
Francois Wuilleumier (Univ. Paris-Sud)

Beamline 10.3.2
Alain Manceau, Frederic Panfili, Geraldine Sarret (Univ. Joseph Fourier, France)

6. OPERATIONS UPDATE

(Contact: Lampo@lbl.gov)

For the user runs of October 31 - November 5 and November 6 - 11, the beam reliability (time delivered/time scheduled) was 97.4%. Of the scheduled beam, 84.7% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 189 November 28, 2001

Contents of This Issue:

1. GAS-PHASE MOLECULES ILLUMINATED FROM WITHIN

by Lori Tamura
(Contact: doerner@hsbpc1.ikf.physik.uni-frankfurt.de)

Seeing is believing, and the importance of visualization is obvious at the molecular level, which lies outside the realm of everyday experience. But because traditional techniques for probing within molecules (such as photoelectron diffraction) require knowledge of the molecule's orientation, they can't provide very information-rich pictures for molecules in the gas phase. Addressing this problem, an international collaboration of researchers has demonstrated a multiparticle coincidence technique at the ALS that yields comprehensive photoelectron diffraction data for gaseous carbon monoxide as if the molecules were fixed in space. The most striking aspect of viewing molecules "illuminated" from within this way is how the results reveal, nearly at a glance, the major physical features at play.

Read the full story (with animations) at
http://www-als.lbl.gov/als/science/sci_archive/46gasXPD.html.

Publication about this research: A. Landers, Th. Weber, I. Ali, A. Cassimi, M. Hattass, O. Jagutzki, A. Nauert, T. Osipov, A. Staudte, M.H. Prior, H. Schmidt-Boecking, C.L. Cocke, and R. Doerner, "Photoelectron Diffraction Mapping: Molecules Illuminated from Within," Phys. Rev. Lett. 87, 013002 (2001).

2. LAST CALL: GENERAL SCIENCES PROPOSALS DUE DECEMBER 1

(Contact: alsproposals@lbl.gov)

Saturday, December 1, 2001, is the deadline for independent investigator proposals in the general sciences for the running period from June to November 2002. (This information does not apply to protein crystallography proposals, which have a separate process and schedule.) Scientists wishing to renew a previous proposal must fill in a one-page ALS Experiment Report and Request for Beamtime form and submit it to the User Services Office by the December 1 deadline. The User Services Office has sent email confirmations for all proposals received so far. If you submitted a proposal but have not received confirmation, please contact Bernie Dixon at

alsproposals@lbl.gov. The numeric rating for each proposal will be communicated to the investigator along with comments from the Proposal Study Panel, where appropriate. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see below). The following resources are available for further information:

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http://www-als.lbl.gov/als/als_users_bl/bl_table.html

Proposal Study Panel (PSP) scores
http://www-als.lbl.gov/als/quickguide/pspscores.html

3. APS SYMPOSIUM ON EXCITED-STATE SPECTROSCOPIES

(Contact: fadley@photon.lbl.gov)

A special symposium on theory and experiment for excited-state spectroscopies will be held at the upcoming March Meeting of the American Physical Society, to be held in Indianapolis, March 18 - 22, 2002. All of the primary soft x-ray techniques used at the ALS will be valid topics for presentation and discussion at this symposium. The deadline for submitting abstracts is December 7, 2002 (for submission details, see http://www.aps.org/meet/MAR02/abs.html). The symposium, "Excited State Electronic Structure and Response Functions" (17.9.1), will explore new methods and algorithms for the quantitative description of excitations and response functions. Contributions from both theory and experiment are encouraged. Invited speakers include Lars Jonsson (Ohio State Univ.), "Accurate electron and hole states in heterostructures"; W. Gero Schmidt (Friedrich-Schiller-Univ., Jena), "Surface optical properties: defects, self-energy"; George Sawatzky (Univ. of British Columbia), "Spectroscopy in correlated systems"; and Eric Shirley (National Institute of Standards and Technology), "Theory of x-ray absorption and scattering." More information on the symposium can be found at http://www.aps.org/meet/MAR02/focus.html#1791.

4. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

by Harald Ade
(Contact: harald_ade@ncsu.edu)

The UEC election results are now in. Sophie Canton, John Bozek, Yasuji Muramatsu, Eli Rotenberg, and Alexander Moewes will be joining the UEC. Their terms start on January 1, 2002. I am sure they will do a wonderful job representing those who voted for them as well as all ALS users.

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

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David Sigee (Univ. of Manchester, UK)
Liane Benning (Univ. of Leeds, UK)

Beamline 4.0.1-2
George Waddill (Univ. of Missouri-Rolla)

Beamlines 5.0.1, 5.0.2, and 5.0.3
Weiru Wang, Shengfeng Chen, Dong Hae Shin (Berkeley Structural Genomics Center)
Mark Knapp, Armando Villasenor (Roche Bioscience)
Zhulun Wang, Jinsong Liu (Tularik, Inc.)
Jiandong Zhang, Tim Osslund (Amgen, Inc.)
Justin Piper, Chu-Young Kim, Marcus Hans, Tom Lee, Hu Pan, Julian Chen, Sheryl Tsai (Univ. of California, San Francisco)
Lidia Mosyak, Joel Bard (Genetics Institute, Inc.)
Alice Vrielink, Paula Lario, Babu Manjasetty (Univ. of California, Santa Cruz)
Michael Marino (Univ. of California, San Diego)
Andreas Kreusch, Glen Spraggon (Genomics Institute of the Novartis Research Foundation)
Doug Juers, Gerry Ostheimer (Howard Hughes Medical Institute)

Beamline 7.0.1
Z.Q. Qiu (Univ. of California, Berkeley)
Jim Tobin (Lawrence Livermore National Laboratory)
Harald Ade (North Carolina State Univ.)
Joerg Schaefer (Univ. of Augsburg, Germany)
Timothy Schuler (Tulane Univ.)

Beamline 7.3.3
Greg Hura (Berkeley Lab)

Beamline 8.0.1
David Shuh (Berkeley Lab)

Beamline 8.3.1
Ernst Bergmann, Jason Maynes, David Arthur, Paul Scott (Univ. of Alberta, Canada)
Kevin Slep, Tom Lee, Hu Pan (Univ. of California, San Francisco)

Beamline 10.3.2
Donald Sparks (Univ. of Delaware)

6. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user run of November 14 - 20, the beam reliability (time delivered/time scheduled) was 98.7%. Of the scheduled beam, 90.7% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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LBNL/PUB-848
Editors: lstamura@lbl.gov, alrobinson@lbl.gov, amgreiner@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

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ALSNews Vol. 190 December 12, 2001

Contents of This Issue:

1. QUANTUM CHAOS IN HELIUM

by Annette Greiner
(Contact: Kaindl@physik.fu-berlin.de)

Two's a party, three's a crowd--especially in a tiny space. Two objects that exert electrostatic or gravitational forces on each other have relatively simple dynamics: the forces scale as the square of the distance between the objects. A three-body system, however, cannot be solved analytically (it is nonintegrable), which indicates that the dynamics involve a mixture of regularity and chaos. Add to that the constraints of quantum mechanics, and things get truly challenging. Now, an investigation into the transition from quantum dynamics to chaos in the spectrum of helium has shed a little bit of light on one of physics's blackest boxes--quantum chaos.

Read the full story at http://www-als.lbl.gov/als/science/sci_archive/47Qchaos.html.

Publication about this research: R. Puettner, B. Gremaud, D. Delande, M. Domke, M. Martins, A.S. Schlachter, and G. Kaindl, "Statistical Properties of Inter-Series Mixing in Helium: From Integrability to Chaos," Phys. Rev. Lett. 86, 3747 (2001).

2. MOLECULAR FOUNDRY WORKSHOP ANNOUNCED

(Contact: MDAlper@lbl.gov)

A workshop to explore the future of nanoscience research and plan for the Berkeley Lab Molecular Foundry will be held in Berkeley on April 4-5, 2002. The Molecular Foundry will be a Department of Energy user facility based on the premise that nanoscience research, both "hard" and "soft," is advancing beyond the synthesis and characterization of nanostructured "building blocks" to the construction of complex functional assemblies of those building blocks. Success will require that investigators have a breadth of facilities available to them: physicists will need living cells, biologists will need nanofabrication and lithography, and all will need theory. The Berkeley Lab Molecular Foundry will meet these needs as a state-of-the-art, multidisciplinary user facility staffed by professionals and open to researchers from university, industrial, and government laboratories.

The workshop will be divided into two sessions. The first session will be dedicated to plenary talks by internationally recognized leaders in the field, exploring the challenges facing the construction of multicomponent functional structures and devices. The second session will be dedicated to small group meetings in which attendees will discuss their views on how Foundry facilities can be designed and operated to be of greatest value to them. This will be an especially important session because the Department of Energy has provided, in the FY 2002 budget, substantial funding to begin the design of the Foundry, and this is the most critical time to hear advice from the community.

To indicate your interest in the workshop and ensure that you receive future announcements, fill out the online interest form available at http://foundry.lbl.gov/.

3. NEW CONCEPT ENHANCES STXM PERFORMANCE AT BEND-MAGNET BEAMLINE

(Contact: harald_ade@ncsu.edu)

A new scanning transmission x-ray microscope (STXM) has been conceived, built, and commissioned at Beamline 5.3.2, which is optimized for carbon, nitrogen, and oxygen NEXAFS. The new STXM design utilizes laser interferometry to control the relative positions of the x-ray optics (a zone plate) and the sample. It provides perfect registration between sets of images at different photon energies with a spatial resolution of 40 nm. The intense, high-energy-resolution illumination of Beamline 5.3.2 and the advanced, interferometry-based instrument make it possible to perform STXM successfully at ALS bend-magnet beamlines.

With previous systems, one could obtain images at a fixed photon energy with close to diffraction-limited resolution, but the effective resolution suffered in applications that required the use of a range of photon energies. Over a typical C 1s NEXAFS scan from 280 to 310 eV, the zone-plate focal length changes by up to 300 micrometers, requiring displacement of the zone plate along the x-ray beam by this amount without disturbing the lateral position of the zone plate relative to the sample. Mechanical systems able to achieve the required precision are exceptional; indeed, experience has shown that spatial resolution in point spectral mode at existing facilities is rarely better than 200 nm and is sometimes much worse. Data processing to correct for misalignments in image sequences taken at many photon energies provides a partial solution, but this incurs a time penalty and generally exhibits a residual degradation in spatial resolution.

The solution developed at the ALS is to introduce a two-dimensional, differential laser interferometer that continuously monitors the relative (x,y) position of the zone plate and the sample. The interferometer is used as part of the feedback control loop for the fast mechanical stage used to scan the sample when making images. This system not only eliminates energy-to-energy image position errors but also helps to desensitize the microscope to vibrational or other environmental noise. For details regarding the first results, see http://www.physics.ncsu.edu/stxm/p-stxm-first-results.pdf. The laser-interferometer concept is also being incorporated into a STXM upgrade now being commissioned at Beamline 7.0.1.

Members of the Beamline 5.3.2 STXM development team include Harald Ade and David Kilcoyne (North Carolina State Univ.); Tony Warwick, Keith Franck, Howard Padmore, Erik Anderson, and Bruce Harteneck (Berkeley Lab); and Adam Hitchcock, Tolek Tyliszczak, and

Peter Hitchcock (McMaster Univ.). This project is funded by DOE, NSF, NSERC, and The Dow Chemical Company.

4. CALL FOR ABSTRACTS: ALS COMPENDIUM 2001

(Contact: LSTamura@lbl.gov)

Every year, the ALS publishes a compendium of abstracts describing the work done, in whole or in part, at the ALS during the past calendar year. All users or user groups (including ALS staff members) should submit a one- to three-page abstract (including figures) describing each project conducted at the ALS during calendar year 2001 (January 1 to December 31), whether published, unpublished, or in progress. The submission deadline is January 28, 2002. Detailed information on submitting abstracts can be found online at http://alspubs.lbl.gov/Compendium_old.

The abstracts received will be published on a CD that will be included in the back of the 2001 ALS Activity Report. Like last year, we will again accept electronic files in a number of formats, preferably PDF. The ALS thanks you for your cooperation in this effort to demonstrate the breadth, depth, and importance of the ALS scientific program. If you have any questions, please contact Lori Tamura by email (LSTamura@lbl.gov), fax (510-495-2111), or phone (510-486-6172).

5. WHO'S IN TOWN: A SAMPLING OF ALS USERS

Following are some of the experimenters who will be collecting data during the next two weeks at the ALS.

Beamline 1.4.3
Hoi-Ying Holman (Berkeley Lab)
Tom Breunig, Dan Fried (Univ. of California, San Francisco)
Felicia Betancourt (Berkeley Lab)
Ted Raab (Carnegie Institution of Washington)

Beamlines 5.0.1, 5.0.2, and 5.0.3
Andre Hoelz (The Rockefeller Univ.)
Bhushan Nagar (Univ. of California, Berkeley)
Glen Spraggon, Andreas Kreusch, Michael Mathews, Dan McMullan (Genomics Institute of the Novartis Research Foundation)
Frank G. Whitby, Perry Brown (Univ. of Utah)
Shengfeng Chen, Weiru Wang, Dong Hae Shin (Berkeley Structural Genomics Center)
Dan Knighton, Hans Parge (Pfizer, Inc.)
Derek Piper, Jinsong Liu, Athena Sudom, Zhulun Wang (Tularik, Inc.)
Armando Villasenor, Mark Knapp (Roche Bioscience)
Jill Cupp-Vickery, Janos K. Lanyi, Hartmut Luecke (Univ. of California, Irvine)
Doug Dougan, Les Tari (Syrrx, Inc.)
Rune Hartmann (The Cleveland Clinic Foundation)

Beamline 6.3.2

Paul Boerner (Stanford Univ.)

Beamline 7.0.1
Brian Tonner (Univ. of Central Florida)
Ivan Schuller (Univ. of California, San Diego)
Stephen Urquhart (Univ. of Saskatchewan, Canada)
Satish Myneni (Princeton Univ.)

Beamline 7.3.3
Baker Farangis (Berkeley Lab)

Beamline 8.0.1
Alexander Moewes (Univ. of Saskatchewan, Canada)

Beamline 10.3.2
Alain Manceau, Frederic Panfili, Geraldine Sarret (Univ. Joseph Fourier, France)
Elizabeth Pilon-Smits (Colorado State Univ.)

6. BERKELEY LAB TO CLOSE FOR HOLIDAYS

Berkeley Lab will shut down on the evening of December 21 and reopen on the morning of January 2. During the closure, the Lab will shut down as much heating and ventilating equipment as possible to reduce costs. However, power to the ALS building will be maintained, and the last user run of 2001 extends through December 23. Anyone having to work on site during this time will need a current ID badge and parking permit to gain access. The User Services Office will provide badging only until 4 p.m. on December 21. Unbadged visitors must have been verified and cleared through the gate by an appropriate host prior to entry. The first user run of 2002 will be January 4 - 7. The next issue of ALSNews will be published on January 23. We wish you all a pleasant and relaxing holiday season.

7. OPERATIONS UPDATE
(Contact: Lampo@lbl.gov)

For the user runs of November 27 - December 3 and December 4 - 9, the beam reliability (time delivered/time scheduled) was 95%. Of the scheduled beam, 80% was delivered to completion without interruption. There were no significant outages.

Long-term and weekly operations schedules are available on the Web (http://www-als.lbl.gov/als/accelinfo.html). Requests for special operations use of the "scrubbing" shift should be sent to Bruce Samuelson (BCSamuelson@lbl.gov, x4738) by 1:00 p.m. Friday. The Accelerator Status Hotline at (510) 486-6766 (ext. 6766 from Lab phones) features a recorded message giving up-to-date information on the operational status of the accelerator.

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ALSNews is a biweekly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content. Submissions are due the Friday before the issue date.

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